ANIMAL AND PLANT HEALTH REGULATORY DIRECTORATE

# ETHIOPIA ANIMAL HEALTH YEARBOOK 2011

ADDIS ABABA, ETHIOPIA

MINISTRY OF AGRICULTURE

ANIMAL AND PLANT HEALTH REGULATORY DIRECTORATE

# ETHIOPIA

# ANIMAL HEALTH YEARBOOK 2011

MAY 2012

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# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AHA | Animal health assistant |
| AHO | Animal health officer |
| AHP | Animal health post |
| AHS | African horse sickness |
| AHT | Animal heal technician |
| AIDS | Acquired immunodeficiency syndrome |
| AIT | Artificial insemination technician |
| AM | Ante-mortem |
| ANA | Anaplasmosis |
| ANT | Anthrax |
| APHRD | Animal and Plant Health Regulatory Directorate |
| ARVL | Asella Regional Veterinary Laboratory |
| AU/IBAR | Africa Union Inter-African Bureau for Animal Resources |
| BAB | Babesiosis |
| BARVL | Benishangul-Gumuz Asosa Regional Veteriary Laboratory |
| BDRVL | Bahr-Dar Regional Veterinary Laboratory |
| BQ | Black quarter |
| BRVL | Bedelle Regional Veterinary Laboratory |
| BSE | Bovine spongiform encephalopathy |
| BSL III | Bio-safety level-three (III) |
| CAC | Codex Alimentarius Commissin |
| CAHW | Community-based animal health worker |
| CBPP | Contagious bovine pleuropneumonia |
| CCPP | Contagious caprine pleuropneumonia |
| CL | Confidence interval |
| CPE | Cytopathic effect |
| CPOX | Cowpox |
| CSA | Central Statistical Authority |
| CSF | Classical swine fever |
| CVLs | Central veterinary laboratories |
| CVO | Chief Veterinary Officer |
| DRVL | Dire-Dawa Regional Veterinary Laboratory |
| EAC | Eastern African Community |
| EARLN | Eastern African Regional Laboratory Network |
| EC | Ethiopian calendar |
| ECF | East coast fever |
| EHV-1 | Equine herpes virus type 1 |
| FAO | Food and Agriculture Organization |
| FAO-ECTAD | Food and Agriculture Organization Emergency Center for Trans-boundary Animal Diseases |
| FCHO | Fowl cholera |
| FDRE | Federal Democratic Republic of Ethiopia |
| FMD | Foot and mouth disease |
| FTYP | Fowl typhoid |
| FVL | Federal Veterinary Laboratories |
| FY | Fiscal year |
| GC | Gregorian calendar |
| GDP | Gross domestic product |
| GRVL | Gambella Regional Veterinary Laboratory |

| | |
|---|---|
| GTP | Growth and Transformation Plan |
| HACCP | Hazard analysis critical control point |
| HPAI | Highly pathogenic avian influenza |
| HRVL | Hirna Regional Veterinary Laboratory |
| HS | Hemorrhagic septicemia |
| IAEA | International Atomic Energy Agency |
| IAH | Institute for Animal Health |
| IBD | Infectious bursal disease |
| IGAD | Intergovernmental Authority of Development |
| ILRI | International Livestock Research Institute |
| IS | Interim Secretariat |
| ISO/IEC | International Organization for Standardization/International Electrochemical Commission |
| JRVL | Jijiga Regional Veterinary Laboratory |
| KAS | Kingdom of Saudi Arabia |
| KRVL | Kombolcha Regional Veterinary Laboratory |
| LSD | Lumpy skin disease |
| LT | Laboratory technician |
| MCF | Malignant catarrhal fever |
| MENA | Middle East and North Africa |
| MI | Meat inspector |
| MiRVL | Mizan Regional Veterinary Laboratory |
| MoA | Ministry of Agriculture |
| MRVL | Makalle Regional Veterinary Laboratory |
| NAHDIC | National Animal Health Diagnostic and Investigation Center |
| ND | Newcastle disease |
| NTTICC | National Tsetse and Trypanosomiasis Control and Investigation Center |
| NVI | National Veterinary Institute |
| OB | Outbreaks |
| OIE | World Organization for Animal Diseases (International Office of Epizootics) |
| PAs | Peasant associations |
| PM | Post-mortem |
| PPR | Peste des petits ruminants |
| PVS | Performance of Veterinary Services |
| QCVL | Quality Control Veterinary Laboratory |
| QS | Quarantine station |
| RAB | Rabies |
| RAS | Republic of South Africa |
| RVF | Rift Valley fever |
| RVL | Regional Veterinary Laboratories |
| SAT | Sequential aerosol technique |
| SAT1, SAT2 | South African Territory types 1 and 2 foot-and-mouth disease viruses |
| SGPOX | Sheep and goat pox |
| SNNP | Southern Nations, Nationalities and Peoples |
| SoRVL | Sodo Regional Veterinary Laboratory |
| SOPs | Standard operating procedures |
| SPS-LMM | Sanitary and Phytosanitary-Livestock and Meat Marketing program |
| SRVL | Semera Regional Veterinary Laboratory |
| STEP | Southern Tsetse Eradication Project |
| T&T | Tsetse and trypanosomosis |
| TADs | Trans-boundary animal diseases |
| TB | Tuberculosis |

| | |
|---|---|
| TCP | Technical Cooperation Project |
| UAE | United Arab Emirates |
| UCD | Unknown camel disease |
| UK | United Kingdom |
| USAID | United States Agency for International Development |
| USDS | United States Department of State |
| VACNADA | Vaccine for the Control of Neglected Animal Diseases in Africa |
| VP1 | Virus protein one (1) |
| VS | Veterinary Services |
| VSB | Veterinary Statutory Body |
| WTO-SPS | World Trade Organization-Sanitary and Phytosanitary Standards |
| YRVL | Yabello Regional Veterinary Laboratory |

# FOREWORD

I cordially welcome you all to the second edition of the *Ethiopia Animal Health Yearbook*.

The necessity of availing authentic, official and reliable information on the important livestock national asset health, in as a comprehensive as possible manner, to all stakeholders cannot be overemphasized. It is extremely important that all stakeholders, interested institutions and individuals participate in generating more relevant and complete information through their direct involvement or by their feed-back comments.

In this second edition of the *Ethiopia Animal Health Yearbook 2010/11*, it was tried to include more relevant information on the activities of APHRD and its counterparts in Regions, as well as all concerned public and private undertakings related to animal health and food safety in the country and beyond.

This second edition contains some historical events in the Ethiopian Veterinary Services, as it has undergone, for the first time, the OIE Performance of Veterinary Services evaluation process, which resulted in encouraging outcome.

Another milestone for the achievement of APHRD and associated partners was the acquisition of recognition from international organization (ISO) by awarding ISOQAR Certificate to Modjo Modern Export Abattoir for fully introducing and implementing hazard analysis critical control point (HACCP) principles in its whole phases of processing, packaging and distributing.
A further important development was the nomination of the National Animal Health Diagnostic and Investigation Center (NAHDIC) to become East African Region Referral Diagnostic Laboratory for avian flu and Newcastle disease.

The new proclamation on veterinary drugs, biologics and animal feeds was also an important event that re-instated the MoA and, through it, the APHRD to regain its righteous position to administer and control these crucial inputs to animal health services.

These are very encouraging developments, indeed, which could motivate the APHRD and all stakeholders to make even greater efforts for revamping the animal health delivery image of the country on international stage.

Although encouraging signs are clearly discernible, I must confess that there is still a long road to cover in the years ahead in order to base the country's animal health services on firmer and higher grounds consistent with the national livestock resource potential and the national development goal in the livestock industry.

Finally, I would like to express my sincere gratitude to all public and private institutions and individuals, who, in one way or another, contributed to the achievements recorded in 2010/11 and for assisting in the preparation and publication of this *Animal Health Yearbook* to uphold and continue with the established tradition.

With kind regards,

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# *EXECUTIVE SUMMARY*

*Ethiopia is globally among the ten leading countries in livestock numbers, particularly cattle. But, this population size is not commensurate with its potential benefit to the country for different reasons of which animal diseases take among the top ranks.*

*Various measures have been taken, and still continue, to reduce the menace that livestock diseases sustain on the country's socio-economic life. It was made possible, through these endeavors, to reduce some of the damages emanating from diseases such as anthrax, blackleg, African horse sickness, and other diseases that respond better to immunization or vaccination. Rinderpest was totally eradicated with sustained and coordinated vaccination campaign with the support of friendly countries and international and regional organizations. However, there are still very seriously damaging endemic and trans-boundary animal diseases, such as foot and mouth disease, contagious bovine and caprine pleuropneumonia, lumpy skin disease and Newcastle disease, to mention only the salient ones that cause loss of production and productivity, and restrict the country from livestock and livestock products market access in international trade.*

*The Ethiopian Government has, particularly since recent past, taken the issue of livestock diseases very seriously, which can be evidenced by the considerable commitments in terms of budget, material and manpower allocation to curb the effect of these diseases on the livelihood of the animal rearing communities and on the national economy at large. The construction of the drugs, biologics, animal products and byproducts Quality Control Veterinary Laboratory at Kalitti and of five quarantine stations of international standards in different target locations together with the introduction into export abattoirs of hazard analysis critical control point (HACCP) principles show how serious the Government is to address the problem of animal diseases and how committed it is to break the deadlock on access to international market of livestock and livestock products from the country.*

*For enhancing the effective, efficient, environment friendly and sustainable animal disease control efforts, appropriate legislative provisions have been prepared and one,' Proclamation No.782/2011, a Proclamation to Provide for Veterinary Drug and Feed Administration and Control' has been endorsed for implementation recently. Subsidiary regulations of this Proclamation and of other proclamations have also been prepared and are expected to be enacted soon.*

*These recent developments have altered the national animal health landscape and the efforts have started bearing fruits, such as the encouraging evaluation result from the OIE Performance of Veterinary Services (PVS) mission to Ethiopia, the interests expressed by importers of animals and animal products from Ethiopia (expression of guests of the NAHDIC is the case in point), and other positive developments.*

*The Animal and Plant Health Regulatory Directorate (APHRD) of the Ministry of Agriculture (MoA) will continue forging ahead with these improvements up until the animal health management situation in the country occupies the required position in world stage.*

*In this Animal Health Yearbook, it is tried to sum-up the major activities and achievements undertaken during the 2010-2011 Fiscal Year. Information of relevance of other years is also reported at varying length as found appropriate.*

*From the various reports in 2010-2011, it is discernible that 49178 or so samples were collected for sero-surveillance and analyzed for different diseases and variable results of prevalence were obtained. Similarly more than 338000 animals for*

*export were given different quarantine services, and tested by the NAHDIC and Regional Veterinary Laboratories against Rift Valley fever and other trade restricting diseases for issuance of International Animal Health Certificate. It will be relevant here to point out that the country is haemorrhaging from illegal cross-border trade of livestock, which should stop by any means.*

*2669 disease outbreaks were reported in which 77153 cases and 14864 deaths were encountered. Overall reporting rate of the year was 29.16%, which was lower than that of 2009-2010 (40.41%), and the preceding five-year reporting average was calculated at 32.92%.*

*Four new diseases, or infections were detected in the country for the first time, comprising a new foot and mouth disease type O strain, topotype EA-3 of Sudan origin, equine encephalosis virus infection, classical swine fever and fish infection with* ***Yersinia ruckeri*** *and* ***Aeromonas hydrophyla****.*

*More than 78,700,000 doses of vaccines were produced by the National Veterinary Institute (NVI) for local consumption of disease control and more than 76,800,000 doses were distributed to Regions. 50,551,250 doses were produced for foreign trade.*

*In the seven (now 9) export abattoirs, some 2,202,860 animals were ante-mortem inspected and 1,913,383 passed post-mortem inspection for export. A 45.57% increase was recorded over that of 2001-2010 annual average.*

*Some US$ 211.1 million was earned in foreign currency from both live animal (70%) and meat sales (30%). Cattle constituted 46% of live animal sales followed by sheep with 35%. Chilled shoats' constituted about 80% of the volume of exported carcasses.*

*These achievements made in the year under consideration may not be taken as epoch-making. However, accomplishments such as the introduction into export abattoirs of HACCP, the construction of quality control laboratory and quarantine stations of required standards, and the harmonization of animal health regulations with international standards, recommendations and guidelines are expected to make real difference in animal health delivery system in the country.*

*It is hoped that with the new developments in legal and technological tools that are being available for the various functions only improvement and progress should be expected in the times to come for the Ethiopian Veterinary Services and related issues.*

# 1. INTRODUCTION

Ethiopia is a country whose economic output to-date has been dominated by arable agriculture and livestock production, contributing some 45% to the gross domestic production (GDP), over 90% of hard currency earnings, and roughly 85-90% of employment opportunities (USDS, 2010; Ethiopia Animal Health Yearbook 2009/2010, 2010) . Arable agriculture is intimately linked and almost totally dependent (about 80% of Ethiopian farmers, Behnke-2010) on animal draught power in crop-livestock production system, a common mode of production in the highland ecosystem. In the pastoralist settings, in the lowlands, livestock comprise the only means of livelihood of the communities residing there.

Current livestock population estimate stands at 52.513 million cattle, 35.86 million sheep, 34.684 million goats, and 4.856 million camels, considering only ruminant livestock species (Behnke, 2010). In addition, 6.0471 million donkeys, 1.99 (nearly 2 million) million horses, 0.63 million mules comprise the livestock resource of Ethiopia, as adjusted by Behnke (2010) from CSA 2009/2010 data on equine population estimates. There are also between 32-42 million poultry.

Overall livestock contribution to Ethiopia's economy is summarized as follows (Behnke, 2010 ; estimate based on 2008-09 FY gross value of livestock, including poultry and honeybees):

a) Agricultural overall output of livestock is estimated at Birr 74.34 billion and accounts for 45% of the agricultural GDP.
b) Preliminary results suggested that the capital value of Ethiopia's national herd as a form of savings was about Birr 86 billion with an annual return of Birr 21-26 billion on this investment
c) 26.4% of the value of annual crop production derive from animal draught power; and this comprises 31% of the total gross value of livestock output represented by the value of animal draught power estimated at Birr 21.50 million.

The contribution of livestock to the country's socio-economic sphere is considered below its potential, taking account of its size and diversity. Amongst the crucial limiting constraints to this huge resource, livestock diseases occupy one of the highest ranks.

Although one of the most devastating diseases of livestock in the country i.e., rinderpest has been eradicated and many other endemic diseases are put under considerable control, there are still some serious trans-boundary animal diseases (TADs), such as CBPP, CCPP, FMD, LSD, AHS, PPR and ND which are limiting the productivity and international trade of livestock and their products. Particular area of concern is the foreign trade opportunities that are getting broader for Ethiopian livestock and livestock products in the Middle East and the African sub-region, provided that risk from TADs is eliminated or is under adequate level of control or protection to pose no threat to trading partners.

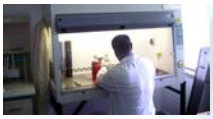
The Government of the Federal Democratic Republic of Ethiopia (FDRE), with the Animal and Plant Health Regulatory Directorate (APHRD) of the Ministry of Agriculture at the helm of the Veterinary Services, is relentlessly pursuing all venues and avenues to acquire national and international recognition on animal health and production management procedures and methodologies to ensure the biological and commercial health of the country's animal resources at all levels. In practical terms, these endeavours are expressed in upgrading and/or establishing new facilities, manpower training and development at all necessary levels, introduction of recognizable quality management systems into various animal health institutions, laboratories, animal and animal products processing plants and associated organizations.

The Veterinary Services is organized under the APHRD in four teams i.e., Animal and Plant Inspection and Certification Case Team, Animal and Plant Disease/Pest Risk Analysis Administration Case Team, Animal and Plant Quarantine Stations Case Team, Export Abattoirs Meat Inspection and Certification Case Team, and one 'National Animal Health Diagnostic and Investigation Center (Appendix 1) at the Federal level. Organizational structures of Regional States differ from region to region. In some of the Regions the veterinary service is organized under the Regulatory Directorate, whereas in others it is organized under the Extension Directorates. In Oromia National Regional State, it is altogether organized under a totally new structure by the name of 'Oromia Livestock Development and Health Agency'. The Amhara Region is to follow suit, as some unofficial moves indicate.

The National Veterinary Institute, which is a para-statal enterprise, works closely with APHRD although it is structurally under the umbrella of the Office of the Minister of State of the MoA.

In this *Animal Health Yearbook 2011,* the second of its kind, major activities, but not all, of the 2010-2011 FY are briefly presented together with updates and/or reviews of major on-going projects and programs, and new project or program activities are described. Other important events that occurred during the period are highlighted. Some facts of other previous years are also included when considered to provide important information and clarity to the document and to interested clients.

## 2. ANIMAL HEALTH POLICIES



GOvernment agricultural policy framework is orientated around food self-sufficiency, poverty alleviation, supply of adequate raw materials to domestic industries, creation of employment opportunity, and increased foreign currency generation through market liberalization, conducive investment environment and natural resource-conservation-based production strategies. Considering animal health, increased production and productivity of national stock through improved and strengthened disease prevention, control and eradication programs together with enhanced public protection from zoonotic diseases and due regard to animal welfare are actively pursued both for domestic consumption and for international trade.

Government policy is shifting from project-based disease control approach to program-based approach to ensure sustainability of activities by making critical inputs and by mobilization of relevant communities through heightened awareness creation for participation in the whole process. Project-based activities will be limited to essential areas of capacity building such as staff training, essential equipment and facility acquisition and establishing or refurbishing necessary institutions.

Many countries in the Middle East, Near East and African sub-region have, in recent years, shown growing interest for animal and animal products from Ethiopia, and the Government of FDRE is striving relentlessly to satisfy the demands and requirements of these countries by improving the performance and status of its veterinary services to win bilateral and international recognition as a reliable and credible body for bearing the task entrusted in it.

As regards external trade of livestock and livestock products, the direction, or the line of action of the Government of FDRE is that of commodity and/or compartment-based trade with internationally recognizable bio-security plan and implementation in the short term, while preparing, simultaneously, for geophysical-based or spatial disease management that will allow greater freedom of international movement from zones or regions liberated from trade restricting veterinary and/or zoonotic diseases.

Legislative support provisions for the implementation of these policy issues, strategies and programs are being continually reviewed, amended or promulgated anew to conform to and harmonize with the ever changing and stiffening national and international animal health delivery standards and movement of animals and animal products. Particular emphasis is given to comply with standards and requirements set by Competent Authorities from trading partners, the World Organization for Animal Health (the OIE) and in line with requirements stipulated by global trade organizations such as World Trade Organization Sanitary and Phytosanitary (WTO-SPS) Agreement.

The legislative support is designed to protect the Ethiopian livestock from exotic disease incursion and from emerging diseases and related animal health issue, while at the same time ensuring the safety and quality of livestock and livestock products to its trading partners

The Proclamation No. 272/2002 E.C. (or 2010 G.C), a Proclamation to Provide for the Re-enactment of Lease Holding of Urban Lands and Proclamation No.782/2011, a Proclamation to Provide for Veterinary Drug and Feed Administration and Control were endorsed in this FY and subsidiary Regulations proposed for these laws are expected to be enacted soon and released for application.

These and related legal provisions which are consistent with national and international norms will, undoubtedly, win national and global confidence on safety, quality and marketability of animal and animal products originating from and destined for Ethiopia.

# 3. VETERINARY EPIDEMIOLOGY, DISEASE PREVENTION, CONTROL AND ERADICATION

## 3.1. Livestock disease surveillance and reporting

The establishment of an effective and efficient surveillance system is a prerequisite for developing and maintaining appropriate system of quarantine and border security, which is the first line of defense for keeping out exotic and emerging diseases. Surveillance is also imperative for devising emergency preparedness and response plan, which constitute the second line of defense in the control and eradication of veterinary and zoonotic diseases, should they penetrate quarantine barrier, and ensuring the biological and commercial health of the country's animal resource. Moreover, surveillance plays a major role in establishing bio-security (biosafety) plans and in conducting risk analysis and risk assessment activities, in general, and in ascertaining compartments and zones with distinct animal health status against specified diseases in particular.

Several actors are involved in the animal health surveillance in Ethiopia. The main actors at the federal level are:

a) The Epidemiology and Disease Control Unit (now renamed as Animal and Plant Disease/Pest Risk Analysis Administration Case Team) of the APHRD of the MoA charged with overall guidance of surveillance activities and central animal health data collection, collation, analysis and dissemination of information (Central Animal Health Data Management System).
b) The National Animal Health Diagnostic and Investigation Centre (NAHDIC) of the MoA charged with referral diagnostic service, also charged with conducting and coordinating animal health surveillance activities. NAHDIC provides guidance and, as necessary, expertise and essential supplies to Regional Veterinary Laboratories (RVL) for surveillance activities.
c) The National Veterinary Institute (NVI) charged, mainly, with production of vaccines required for domestic consumption and for export, but also supports diagnostic and surveillance programs for emergency preparedness, disease prevention, control and eradication.
d) The National Tsetse and Trypanosomiasis Investigation and Control Center (NTTICC), (now under the umbrella of NAHDIC) and the Souther Tsetse Eradication Project ( with its Kalitti Tsetse Fly Mass-rearing Facility), charged with the surveillance of tsetse-borne and non-tsetse-borne trypanosomosis and related problems and with devising appropriate tsetse and trypanosomosis (T&T) control and eradication strategies.

At Region level, the main actors in surveillance activities are:

a) Regional Veterinary Services which, with the support from RVL, are charged with collection, collation and reporting of information on their activities and on animal health situation to their Regional Bureaus of Agriculture (RBoA), to APHRD, and to others requiring these information.
b) Regional Veterinary Laboratories are charged with conducting surveillance and diagnostic activities in their respective regions.

Active and/or passive surveillance activities are also carried out on other sections of the animal health services including slaughterhouses, disease control and eradication projects, quarantine stations, check posts, international entry and exit ports and others as required.

Animal health surveillance is generally undertaken, in Ethiopia, for the following purposes:

i) Surveillance of general nature over purposively selected livestock populations to obtain overall animal health situation and trends
ii) Surveillance in selected exotic disease incursion-prone areas to enable prompt action to be taken should the incident occur. (The East Coast Fever surveillance in border areas with Kenya and Southern Sudan is an example for the case in point).
iii) Surveillance to claim freedom from disease such as rinderpest eradication from the country
iv) Surveillance in periods of natural calamities such as drought, flooding and others that could affect animal health and production, as experience in the past has witnessed repeatedly.
v) Surveillance on natural environment for inadvertently or intentionally committed bio-safety and bio-security hazards, respectively, to prevent such incidents to occur and/or take swift action of mitigating the consequences on animal and public health, should they happen.
vi) Surveillance for prioritizing interventions on animal health problems to assist in informed decision-making process by concerned authorities
vii) Surveillance for complying with country's international commitment to produce valid reports on animal health status of the country, and in doing so facilitating international trade of livestock and livestock products originating from Ethiopia
viii) Surveillance on selected list of important diseases with highest threat of causing emergency situation, and for preparing and, as required, periodically reviewing specific contingency plans for these diseases or health hazards
ix) Surveillance and monitoring of diseases that are under national (regional) control and eradication programs/projects to obtain the effectiveness, or otherwise of the program or project operations. Sero-surveillance for obtaining immunity status of herds or flocks under VACNADA project could be cited as an example.
x) Surveillance for providing information for risk analysis on an animal health hazards

These surveillance activities have the overarching objective of deterring or mitigating animal health hazards, thus ensuring healthy animal populations, food safety and quality, and public protection from zoonotic diseases and other health hazards that could affect domestic and/or foreign consumers.

To effectively and efficiently shoulder these responsibilities and functions, it is obvious that a competent and capable national animal health surveillance system should be in place. Ethiopia is consistently and persistently pushing for strengthening animal disease surveillance by committing substantial resources in terms of required financial, infrastructural and adequately trained and skilled manpower inputs.

The abovementioned government endeavors are best explained by recent developments at regional and international level where NAHDIC was nominated by Food and Agriculture Organization of the United Nations (FAO/UN) and by Eastern Africa Regional Laboratory Network (EARLN) as a FAO Regional Referral Laboratory for Avian Flu and Newcastle Diseases Diagnosis as of May 2011. The request was made by FAO to the World Organization for Animal Health (OIE) and based on the assessment findings of the independent body and on 25 criteria for selection by different actors, i.e. the EARLN interim

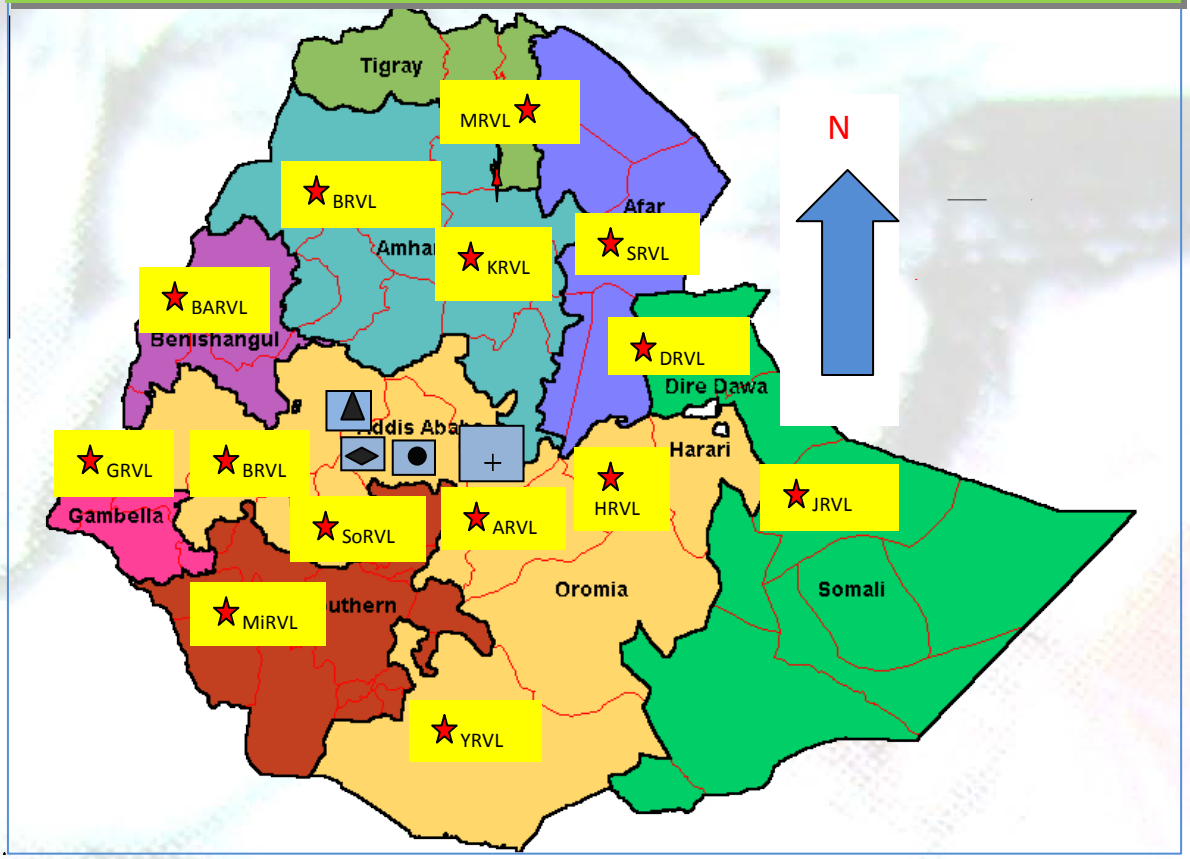
secretariat (IS), [composed of FAO-ECTAD, AU-IBAR, OIE, two representatives from EARLN Member States central veterinary laboratories (CVLs) in the region, the East African Community (EAC), and the Intergovernmental Authority on Development (IGAD)] was mandated to deliberate on reviewing of dossiers from applicant countries on 9th and 10th May 2011, Nairobi, Kenya after which it was decided by participants for NAHDIC to be the referral veterinary laboratory as requested by FAO, with attached terms of reference.

NAHDIC is also the sole central veterinary laboratory in Eastern African Region with bio-safety level III (BSL III) facility for handling dangerous biological agents and materials.

The NVI also has special capacity and competence in cell culture and associated techniques to assist in disease surveillance so that the two central veterinary laboratories complement each other to constitute a suitable pair enhancing national surveillance activities in the country. NVI has special competence and capability in feed analysis too.

An important prerequisite for effective and efficient surveillance system is the availability of competent and capable diagnostic laboratory, and this criterion is almost fully satisfied as there is a well targeted Regional and Federal (National) Veterinary Diagnostic Laboratory Network in the country (Map 1) to provide confirmed test results to field findings or suspicion on animal diseases of internal or external origin, and for guiding subsequent response plans and actions.

**Map 1: Distribution of Federal and Regional Veterinary Laboratories in Ethiopia**




Legend: ARVL= Asela Regional Veterinary Laboratory; BARVL= Benishangul-Gumuz Asossa RVL; BDRVL=Bahr Dar RVL; BRVL= Bedelle RVL; DRVL=Dire-Dawa RVL; GRVL= Gambella RVL; HRVL= Hirna RVL; JRVL= Jijiga RVL; KRVL= Kombolcha RVL; MRVL= Makalle RVL; MiRVL= Mizan RVL; SRVL= Semera RVL; SoRVL= Sodo RVL; YRVL= Yabello RVL; ▲ = National Animal Health Diagnostic and Investigation Center (NAHDIC); ◆ = Kalitti Tsetse Fly Mass-rearing Facility; ┼ = National Veterinary Institute (NVI); ● = Quality Control Veterinary Laboratory.

### 3.1.1. Active surveillance

According to the NAHDIC report, surveillance and related disease investigative and diagnostic activities were conducted as follows:

- In its capacity and mandate as a referral diagnostic laboratory, more than 200 animal disease outbreaks that occurred in the country were diagnosed and recommendations suggested to relevant customers by the NAHDIC. The majority of the outbreaks were diagnosed by NAHDIC, and few were confirmed by the OIE reference laboratories. Diseases frequently diagnosed included FMD, PPR, AHS, Gumboro and ND.
- Surveillances were carried out on diseases of national concern. These were done for:

- FMD collecting 6854 samples and analyzing 5846,
- PPR collecting 4334 >> >> >> 3736,
- UCD >> 400 >> >> >> 400,
- RVF >> 7869 >> >> >> 4726,
- HPAI >> 1939>> >> >> 1920,
- IBD >> 2456 >> >> >> 705,
- Tb >> 4260 >> >> >> 4260

- 1289 samples were submitted by RVLs and other clients of which 1069 were analyzed and feed-back performed.
- 15 test guidelines (standard operating procedures-SOPs) were prepared and distributed to different end-users within and out of NAHDIC to enhance diagnostic and surveillance capacities and capabilities for valid results.
- Surveillance results revealed that RVF, HPAI and ECF are not found in the country. The surveillance of these diseases, i.e. RVF, HPAI, ECF, and also of rinderpest has continued for the purpose of early detection and swift response should they occur at any time. For other surveyed diseases, circulating strains were identified, their distribution determined, and their potential impact assessed.
- Surveillance is also underway on socio-economically important and trade limiting diseases, which include FMD, PPR, CBPP, brucellosis (mainly of bovine and of small ruminants) and tuberculosis in order to devise effective and efficient strategies for their control.
- A total of 8279 samples have been collected and analyzed from dairy farms in the city of Addis Ababa and its surroundings to obtain information on the prevalence and distribution of bovine (and also human) tuberculosis (TB) in the area in view to recommending appropriate sanitary and bio-security measures of preventing, controlling or eliminating the disease.

Major active surveillance activities undertaken during the 2011 FY comprise the following diseases:

## a) Poultry

### 1. Gumboro disease (Infectious bursal disease-IBD)

Gumboro disease surveillance/investigation was conducted by the NAHDIC in different Regions and results of the work is summarized in Table 1.The disease was first reported in a farm at Debre-Zeit in 2005 (Aschalew *et al.*, 2005) with high mortality of 49.89% in the affected 20-25 day-old broiler and layer chicken. The disease has since spread to all investigated commercial farms and multiplication centers occurring at an average outbreak rate of 3-4 farms per year. The disease was encountered commonly in backyard poultry production systems as well.

Overall prevalence rates at the time of this NAHDIC surveillance was found to be about 77.48 % from the 706 samples collected and analyzed, as depicted in Table 1.

**Table 1: Prevalence of IBD/Gumboro disease in different parts of Ethiopia**

| Study area | No. of samples tested | Positives | Positivity 95% CL |
|---|---|---|---|
| **Bekoji** | 48 | 18 | **37.5** |
| **Chancho** | 40 | 34 | **85** |
| **Woliso** | 40 | 31 | **77.5** |
| **Huruta** | 40 | 19 | **47.5** |
| **Metahara** | 47 | 45 | **96** |
| **Zeway Dugda** | 35 | 15 | **43** |
| **Chara (Bedele)** | 25 | 24 | **96** |
| **Dega** | 11 | 4 | **36** |
| **Bati** | 21 | 21 | **100** |
| **Basona Werena** | 41 | 39 | **95.1** |
| **Debre Brehan** | 75 | 71 | **94.7** |
| **Kewet** | 69 | 68 | **98.6** |
| **Dagam** | 52 | 37 | **71.2** |
| **Kuyu** | 71 | 50 | **70.4** |
| **Wara-Jarso** | 91 | 71 | **78** |
| **Total** | **706** | **547** | **77.48** |

## 2. New castle disease (ND)

Newcastle disease has become a major problem for village chicken globally, and large number of wild avian species is believed to harbor ND virus. The disease affects also large-scale commercial poultry farms despite stringent bio-security measures, which can be witnessed by the 2000 Mexico outbreak which resulted in destruction of 13.6 million birds (Otte *et al.,* 2004).

New castle disease was reported in Ethiopia for the first time from Asmara in 1972. The disease has become one of the most important poultry production constraints in both commercial and backyard management systems causing up to 80 % mortality in unvaccinated flocks (Gulima, 2011). The same report states that the disease has become endemic in the country and several unconfirmed disease outbreaks were reported since 2007-2011.

## b) Small ruminants

### 3. Peste des petits ruminants (PPR) and contagious caprine pleuropneumonia (CCPP)

The 'Vaccine for the Control of Neglected Animal Diseases in Africa (VACNADA)' project required to generate information on the pre-vaccination and post-vaccination status of the two diseases. To this end, project areas were selected in eight Regional States of Afar, Amhara, Benishangul-Gumuz, Dire-Dawa City Council, Oromia, Somali, Southern Nations, Nationalities and Peoples (SNNP),and Tigray. Sub-regions or *woredas* involved are summarized in Table 2. The size of serum samples targeted and the actual numbers collected are depicted in Table 3.

**Table 2: Number of Regions and *woredas* selected for vaccination against PPR and CCPP**

| No. | Regions | No. *woredas* involved | | Remarks |
|---|---|---|---|---|
| | | **PPR** | **CCPP** | |
| **1** | Afar | 2 | 4 | |
| **2** | Amhara | 10 | 5 | |
| **3** | Benishangul-Gumuz | 2 | | |
| **4** | Dire-Dawa City Council | - | 1 | |
| **5** | Oromia | 37 | 11 | Including pastoral |
| **6** | Somali | 5 | 2 | |
| **7** | SNNP | 6 | 12 | |
| **8** | Tigrai | 9 | 1 | |
| | Total | 71 | 36 | |

| Table 3: Serum samples collected for PPR and CCPP sero-surveillance and sero-monitporing in selected areas | | | | |
|---|---|---|---|---|
| **Labs Involved** | **No. *woredas*** | **Targeted serum sample** | **Serum collected** | **% achieved of target** |
| **Asella Reg.Vet.Lab.** | 3 | 1200 | 1200 | 100 |
| **Bahr-Dar " " "** | 2 | 800 | 795 | 99.4 |
| **Dire-Dawa " " "** | 1 | 400 | 400 | 100 |
| **Jijiga " " "** | 2 | 800 | 800 | 100 |
| **Kombolcha " " "** | 2 | 800 | 800 | 100 |
| **Makale " " "** | 3 | 1200 | 1200 | 100 |
| **Semere " " "** | 2 | 800 | 800 | 100 |
| **Sodo " " "** | 3 | 800 | 931 | 116.4 |
| **Yabello " " "** | 3 | 1200 | 1200 | 100 |
| **Total** | **21** | 8000 | 8126 | 101.60 |

## c) Cattle

### 4. Lumpy skin disease (LSD)

The disease has been detected to occur in the country in 1983 in the north-western part of Ethiopia, south-west of Tana Lake. The disease has, since, made continuous assault in adjoining regions until it covered almost the whole country with different outbreaks at different times in different areas. Feedlot farms have recently suffered heavy losses up until this year. For reasons not clearly understood yet, vaccinated animals were found to be infected and succumbed to the disease.

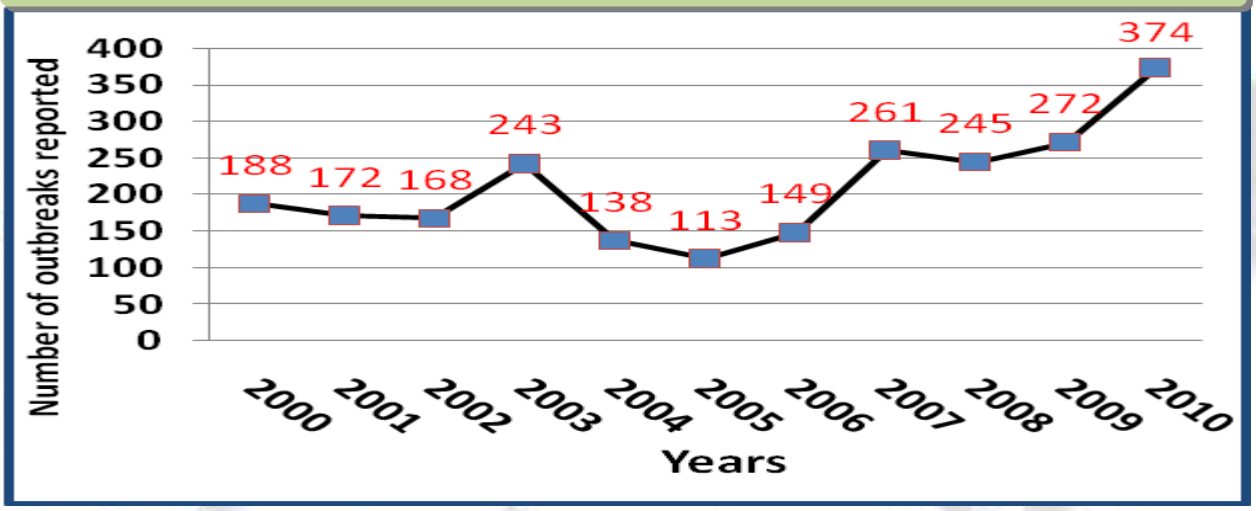
Surveillance of lumpy skin disease was conducted along livestock and meat trade routes (value chain) and connected areas. More attention was given to areas of origin of export animals as well as feedlots where the export animals are kept under quarantine measures for finishing before their dispatch for export.

A committee of experts was formed (VACNADA CLOSE-OUT WORKSHOP, 2011**)** to investigate the whole situation to collect both primary and secondary data by being in the field and in concerned veterinary laboratories and clinics. It also made contacts with livestock traders around Adama and Modjo towns and pastoralists in Borena and Guji zones from where the majority of export animals originate. The committee made risk assessment, which indicated the limited exposure of animals in their areas of origin, the likely exposure of new arrivals in infected feedlots, the assumption that the new arrivals were being vaccinated after exposure in feedlots while undergoing disease incubation and the probability level of LSD occurrence at identified potential risk nodes. The Committee made recommendations for planning and implementing sanitary and bio-security measures in the feedlots and related facilities for the mitigation of the incidents and safe domestic and international trade of animals and animal products in and from the country, respectively.

The disease is on the increase in general as depicted in Figure 1 below. However, this may not reveal a complete picture over the whole country although disease outbreak reports (Table 6) appear to be consistent with the assertion in the

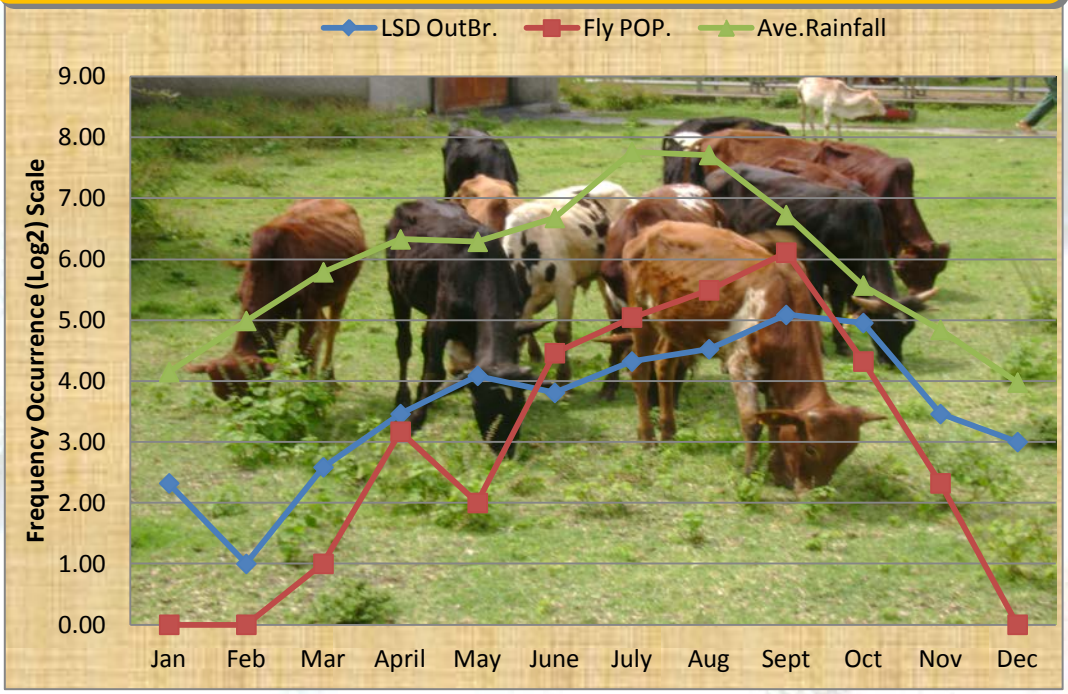
preceding sentence. Figure 2 shows strong link of disease occurrence with wet season (May to October), indicating the influence of insect vectors, which are abundant in most parts of the country during this period.

**Figure 1: Lumpy skin disease (LSD) outbreak frequency in recent years, 2000-2010**




Source: Gulima, D. (2011) and APHRD reports.

**Figure 2: LSD frequency distribution showing strong link with seasonal (vector population) influence**




Source: Adapted from Gari (2010) citing *Epidemiology and Infection Journal, 2010*.

## 5. Contagious bovine pleuropneumonia (CBPP)

A national serological survey performed by the NAHDIC in 2004 provided an assessment of the incidence and prevalence of the disease. The country was divided into three different areas (Map 2):

i) Endemic
ii) Risk prone, and
iii) Disease-free Zone

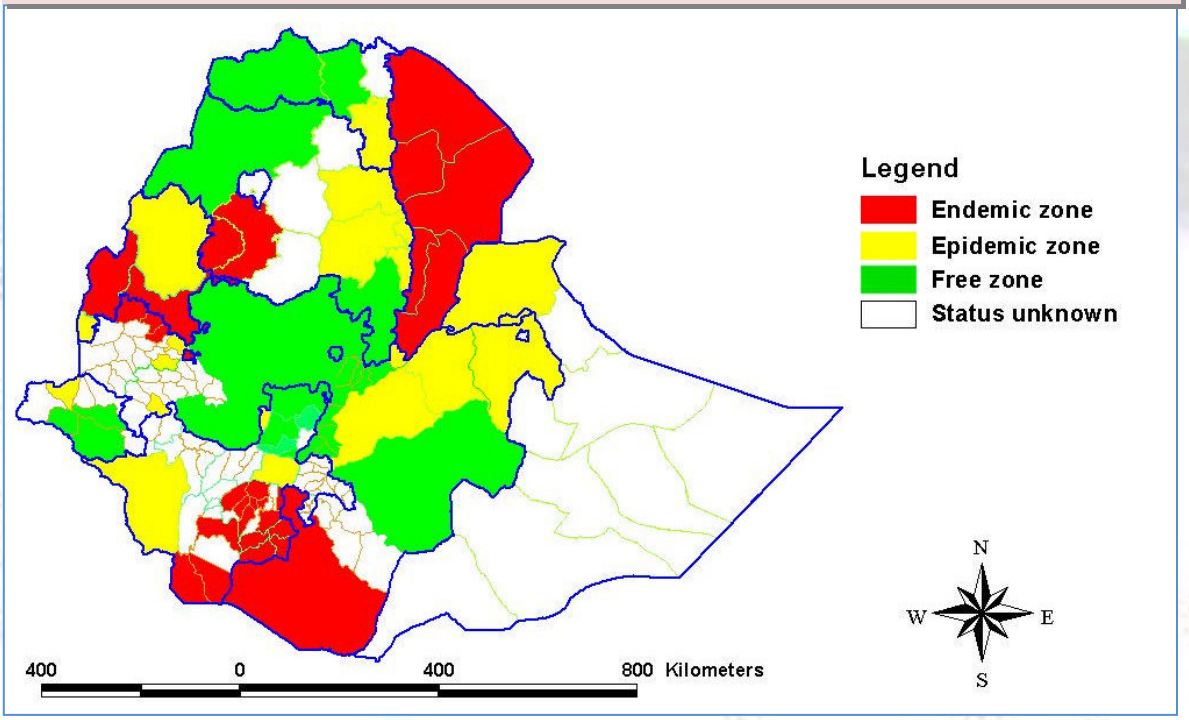
The sero-surveillance results conducted by the NAHDIC in 2004 are presented in Table 4. Gambella and Benishangul-Gumuz Regional States appear to be more affected by the disease compared to the other Regions. However, continuous surveillance and monitoring is required to substantiate this claim.

During the years 2002-2010, it was reported that 306 outbreaks, 10084 cases and 5284 deaths occurred in different parts of the country (Gulima, 2011), as displayed in Table 5 .

The highest CBPP outbreak reported in the country occurred in 1998 with 187 outbreaks, 5652 cases, and 1071 deaths, as reported by Tuli (2010) citing MoA (2002). It is inferred that overall disease situation is on the decline compared to situations before 2002.

However, the disease is still widely distributed and the low prevalence that different studies purport should not sub-serve complacency that would affect the necessary vigilance of mitigating any potential risk which may arise at any one time.

**Map 2: Classification of areas in Ethiopia in relation to CBPP status**




Source: Darsema Gulima's presentation at VACNADA close-out workshop, 5-7 December, 2011, Debre-Zeit, Ethiopia.

**Table 4: CBPP sero-surveillance performed by the NAHDIC in different Regions of Ethiopia showing disease distribution and prevalence rates**

| Region | No Zone | No District | Total sample | Negative | Positive | prevalence |
|---|---|---|---|---|---|---|
| **Afar** | 3 | 3 | 1080 | 1080 | 79 | **7.31** |
| **Amhara** | 9 | 12 | 4320 | 4260 | 56 | **1.29** |
| **B.Gumuz** | 2 | 2 | 720 | 633 | 87 | **12.05** |
| **Gambela** | 1 | 2 | 720 | 578 | 142 | **19.72** |
| **Oromia** | 11 | 20 | 7140 | 6730 | 410 | **5.74** |
| **SNNP** | 8 | 8 | 2700 | 2553 | 147 | **5.44** |
| **Somali** | 2 | 3 | 1110 | 1099 | 11 | **0.9** |
| **Tigray** | 2 | 4 | 1140 | 1352 | 88 | **6.11** |
| **Total** | **38** | **54** | **19230** | **18210** | **1020** | **5.63** |

According to 2002-2011 outbreak reports(Gulima, 2011), case fatality of CBPP can be estimated at 16%, and according to 2002 (Tuli, 2010 citing MoA,2002) nearly 19% , entailing a total loss of between 1613 and 1916 head of cattle through mortality alone without considering morbidity, draught power and other losses from the 10084 affected (cases) animals (Tables 4 & 5).

**Table 5: CBPP outbreaks and how they impacted on cattle resource during 2002-2010**

| Region | No Zones | No Districts | No Outbreaks | No Cases |
|---|---|---|---|---|
| Afar | 10 | 15 | 18 | **3235** |
| Amhara | 14 | 14 | 74 | **455** |
| B.Gumuz | 5 | 6 | 11 | **334** |
| Gambela | 4 | 4 | 5 | **673** |
| Oromia | 30 | 58 | 126 | **2428** |
| SNNP | 16 | 18 | 59 | **835** |
| Somali | 4 | 5 | 7 | **2839** |
| Tigray | 5 | 5 | 6 | **40** |
| Total | **88** | **126** | **306** | **10084** |

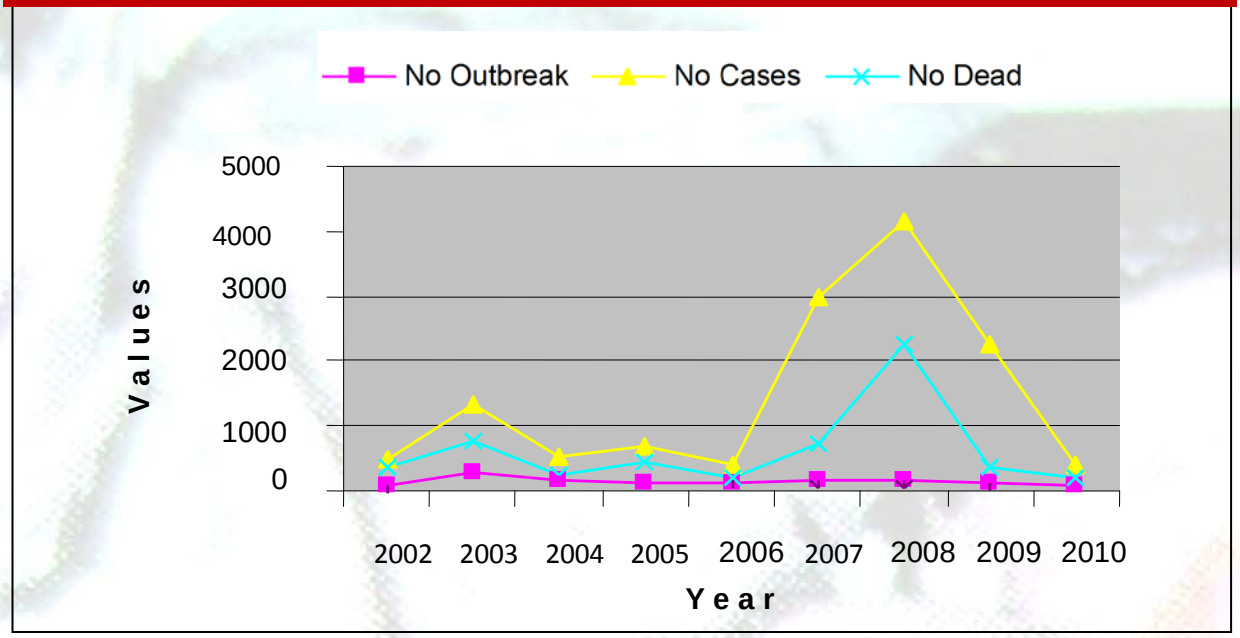
Source: Gulima (2011), and APHRD reports.

## d) Equine

### 6. African horse sickness (AHS)

African horse sickness has always been an intimidating disease for almost all horse breeders of the country although its impact has been more severe in areas of lower altitude where insect vectors are abundant. In a recent review (Abie, 2010) of the status of the disease in the country, it is stated by citing another document (Defra, 2008) that the disease was being reported to the OIE since 1993 and is considered endemic. It also declared that the disease has caused immense losses during 2002-2010 with the highest incident occurring in 2008 causing 319 outbreaks and sustaining 2200 fatalities in the affected horse population. The culprits of the 2008 epidemic were unraveled to be AHSV serotypes 9, 6, and 2 (Abie, 2010 citing Maclachlan and Guthrie, 2010).

**Figure 3: African horse sickness outbreaks and its effects in different parts of Ethiopia, 2002-2010**




## e) Camels

### 7. Unknown camel disease

The cause of this disease is not conclusively determined. Many studies, including participation of experienced expatriates through assistance, did not unravel the mystery. Time and again the disease waxes and wanes across camel breeding areas of the country producing heavy losses and appalling community outcry. Investigations are being continued by the NVI and others to obtain conclusive results.

## f) Multiple species

### 8. Foot and mouth disease (FMD)

FMD is an endemic disease in Ethiopia affecting mainly cattle in the majority of cases, but also causing problems in small ruminants (and camels?) at infrequent intervals. Historically the disease was first reported in 1957 (Gulima, 2011 referring to FAO's WRL), although the disease had, undoubtedly, been in the country for longer timeframe prior to this report, as most of livestock keepers were familiar with the disease and some were using traditional methods of immunization against it, i.e. 'mouthing'.

FMD is one of the most socio-economically important cloven-hoofed animal diseases in the country and amongst the major obstacles of animal and animal product trade on international market. The frequency distribution of FMD and its variation from year to year is not, yet, well understood.

Ethiopia is paying serious attention to put FMD under effective control in view to enhancing foreign trade as well as improving national stock performance characteristics through widening the gene pool either by upgrading local stock or introducing known high grade exotic breeds from abroad, attempts which have been seriously hampered due to the presence of this disease (and of others) in the country.

FMD is one of the economically important TADs for which the country is on the course of developing effective control strategies and for which targeted specific surveillance is being conducted. The surveillance is aimed at generating essential temporal, spatial and economic impact data to assist in developing the appropriate control strategy and, to have information on types and strains of the virus circulating in the country for producing effective vaccines.

It is important to note that FMDV types prevailing in the country changed their composition through time (Leforban, 2005) as summarized below:

| **Period** | **No Samples** | **Virus Types** |
|---|---|---|
| 1957-1973 | 98 | O, A, C |
| 1973-1988 | not available | O, A |
| 1988-1994 | 16 | O, SAT2 |
| 1994-2000 | 67 | O, A, SAT2 |
| 2000-2005 | 7 | O, A, SAT2 |

In another report of genetic characterization of FMD viruses of Ethiopia from 1981-2007 (Gelagay *et al.*, 2009), it was disclosed that 5 of 7 FMDV serotypes circulated in Ethiopia, comprising O, A, C, SAT2, and SAT1. In this same report, it is stated that serotype C is not detected in the country after 1983. Serotype O was found to be dominant followed by serotype A. This report revealed that the phylogenetic analysis of virus protein 1 (VP1) sequences on samples from Mizan Teferi indicated the emergence of a new topotype within serotype O, East Africa 4 (EA-4), apart from the dominant topotype within serotype O of EA-3 encountered in Eritrea, Ethiopia and Sudan. Serotype SAT1 is noted to have been detected in Ethiopia in 2007 and formed a new distinct topotype. SAT2 reappeared after an apparent gap of 16 years. East Africa, in this report, is considered to play the role of a reservoir of FMD viruses based on the diversity of viruses encountered in the region.

It is stated (Sahle and Rufael, 2010) that national surveillance on FMD, which was conducted during 2007-2009, showed 20% sero-prevalence of the virus in local cattle with virus type composition of O, A, SAT1 and SAT2. Types O and A were found to be dominant, here too, followed by SAT2, whereas SAT1 was rarely encountered.

The occurrence and frequency distribution of FMD is depicted in Table 6 from the APHRD report of 2011.

In another report from Borana and Guji zones of Oromia (Habtamu Mokonnen *et al.*2011) overall individual FMD prevalence is calculated at 24.6%.

**Table 6: Sero-prevalence FMD at herd and individual levels in different Regions of Ethiopia**

| Region | Total sample | PAs | Individual positive | Individual % positive | Herd positive | Herd % positive |
|---|---|---|---|---|---|---|
| **Oromia** | 3909 | 269 | 578 | 14.8 | 174 | 64.7 |
| **Ben/Shangul** | 655 | 43 | 41 | 6.3 | 20 | 46.5 |
| **SNNP** | 2070 | 140 | 146 | 7.1 | 59 | 42.1 |
| **Amhara** | 1767 | 116 | 169 | 9.6 | 62 | 53.4 |
| **Tigray** | 390 | 26 | 51 | 13.1 | 18 | 69.2 |
| **Somali** | 272 | 18 | 29 | 10.7 | 12 | 66.7 |
| **Dire-Dawa** | 45 | 3 | 0 | 0 | 0 | 0 |
| **Addis Ababa** | 412 | 27 | 119 | 28.9 | 25 | 92.6 |
| **Total** | 9520 | 642 | 1133 | 11.9 | 370 | 57.6 |

**Source: Gulima (2011). Status of Major Animal Diseases in Ethiopia**

In very recent report (Bewket *et al.*, 2012) on 58 FMD outbreaks of 2011 in Addis Ababa, Amhara, Gambella, Oromia, SNNP and Tigray Regional States it is disclosed that there were 17577 cases comprising 13249 bovine, 4063 caprine, and 265 ovine with mortality of 373, 309 and 64, respectively, totaling in deaths of 746 head of animals. This same report also revealed the involvement of swine in Adaa district (*woreda*), Eastern Shoa Zone of Oromia, in which 11 of 19 samples examined turned to be positive for FMD virus.

Samples tested for FMD certification on 32284 animals for export showed an overall positivity of 14.82 % as depicted in Table 7.

All the virus serotypes and topotypes were similar, i.e. O serotypes, EA-3 except the Makalle outbreak topotype, which was identical with Sudan topotype (Table 8).

**Table 7: Samples tested for FMD for export certification**

| Region | Zone | District | Species | No. tested | No. positive | % Positivity |
|---|---|---|---|---|---|---|
| **Amahara** | North wollo | Desse | ovine | 2764 | 53 | 1.92 |
| **Dire** | - | - | caprine | 1625 | 32 | 1.97 |
| **Dawa** | - | - | caprine | 289 | 7 | 2.42 |
| | | | Ovine | 139 | 2 | 1.44 |
| **Oromia** | East shoa | Fentalle | ovine | 1000 | 22 | 2.20 |
| | | Fentalle | ovine | 9304 | 103 | 1.11 |
| | | Fentalle | ovine | 226 | 1 | 0.44 |
| | | Fentalle | ovine | 8468 | 1187 | 14.02 |
| | | Fentalle | ovine | 21 | 2 | 9.52 |
| | | Fentale | caprine | 399 | 2 | 0.50 |
| | | Fentalle | bovine | 1103 | 267 | 24.21 |
| | | Fentalle | bovine | 386 | 107 | 27.72 |
| | | Adama | bovine | 2943 | 1148 | 39.00 |
| | | Mekey | bovine | 3617 | 1850 | 51.14 |
| **Total** | | | | **32284** | **4783** | **14.82** |

Source: Bewket *et al.* 1012. Presentation on FMD Surveillance, Laboratory and Diagnostic Activities in Ethiopia to the East African-FMD Laboratory 3rd Annual Network meeting 5th March 2012 Nairobi, Kenya.

**Table 8: Outcome of virus typing (Serotyping and Molecular typing)**

| No. | Site of Outbreaks | Species of animal | No. samples | Showing CPE | Serotype identified | Topotype identified |
|---|---|---|---|---|---|---|
| **1** | Addis Ababa | Cattle | 2 | 2 | O | EA-3 |
| **2** | Debre Zeit | Cattle, swine | 14 | 7 | O | EA-3 |
| **3** | Makalle | Cattle, sheep goats | 11 | 1 | O | EA-3 Sudan |
| **4** | Sidama | Cattle | 7 | 3 | O | EA-3 |
| **5** | Adama | Cattle | 2 | 1 | O | EA-3 |
| | **Total** | | 36 | 14 | | |

Source: Bewket *et al.* 2012. Presentation on FMD Surveillance, Laboratory and Diagnostic Activities in Ethiopia. East African-FMD Laboratory 3rd Annual Network Meeting, 5th March 2012, Nairobi, Kenya.

### 9. Rift Valley Fever (RVF)

Rift Valley fever is a mosquito-borne viral disease affecting many animal species and humans. Commonly susceptible domestic animals include, cattle, sheep, goats and camels and the new born and young suffer the most, while the pregnant hosts usually abort although adults may react mildly. Humans could be infected both through the mosquito bites as well as through contact with affected hosts and contaminated fresh tissues and excretions. It is believed that up to half a million people became infected with RVF during the 1997-1998 epidemic in Eastern Africa of which about 500 are estimated to have died. The outbreak of the disease between 2006 and 2007 killed more than 100 people in Kenya, a significant loss in livestock and livelihood, particularly for pastoralists (ILRI NEWS.mht).

RVF epidemics emerge periodically at intervals between 8 to 15 years (or even more) following prolonged rains, such as during El Nino rains or years. In East Africa RVF occurs as explosive outbreaks separated by prolonged period of 8-10 years (ILRI NEWS.mht).

Clinical disease has never been confirmed in Ethiopia, but its proximity to noso-areas in the region of Eastern Africa has exposed her to repeated trade bans on live animal export opportunities, resulting in immense socio-economic consequences both at the household and at national levels.

It would be relevant to refer to the kind and size of these livestock trade-ban-related losses that the Republic of Somaliland in our region suffered. In the 1998-1999 ban the loss estimate that this country suffered amounted to some US$109,527,328 due to exclusion of 2,453,156 live animals that would have been exported to Middle East and Gulf States (Cagnolati *et al.*, 2006). Similarly, in the 2000-2002 ban, the loss estimate was put at US$326,362, 813 with the exclusion of 5,950,981 live animals from exportation (*vide supra*).

Ethiopia has developed OIE-recommendation-based contingency plan for RVF emergency and the appropriate response management system, should the disease occur. To enhance the early warning system and emergency preparedness, both active and passive surveillances are conducted at irregular intervals consistent with RVF favorable climatic conditions, especially in areas of elevated risk of disease incursion along Somalia, Kenya and South Sudan borders considered to be RVF endemic.

### 10. Highly pathogenic avian influenza (HPAI)(bird flu or fowl plague)

Avian influenza has been recognized as a highly lethal generalized viral disease of poultry since 1901 (Otte *et al.*, 2004). In 1955, a specific type of influenza virus was identified as the causal agent of what was then called as fowl plague (Otte *et al*., 2004). The same authors state that the virus of AI was, since, found to cause a wide range of disease syndromes, spanning from severe to mild in domestic poultry. Pathogenic strains are told to have the potential to emerge and cause disease in domestic poultry in any country at any time without warning. The most serious epidemic in recent times, according to this same report, was that which occurred in Hong Kong in 1997-1998 and 2003, The Netherlands 2003, South Korea 2003 and East Asia in 2004.

The global scare of the abovementioned epidemics had also impacted Ethiopia to take the necessary precautions by way of establishing, in 2005, a multidisciplinary National Committee for producing a National Contingency Plan for Highly Pathogenic Avian Influenza Epidemic and Response Action Plan. Active surveillance is in place to provide for the contingency plan and response management, should any eventuality prevail in the country concerning this disease and related events.

It should be noted here that there appears to be creeping in some complacency as the epidemics foreseen did not come-by as expected. Vigilance should be upheld and occasional reactivation of the National Committee with some type of disease emergency simulation practices be conducted at reasonable and acceptable cost.

### 3.1.2. Passive surveillance (Disease reporting)

A major part of passive surveillance is disease reporting. Passive surveillance also constitutes assessing documented reports and analyzing samples sent from field services and from other clients to diagnostic laboratories. Unfortunately, most of disease reports, to-date, in Ethiopia are not laboratory confirmed and are, rather, reports based on suspicions and on owner information. Even these are not regularly submitted from all *woredas* on the monthly basis, as intended by the Competent Authorities and according to OIE requirements.

The APHRD has made efforts to improve the low rate of disease reporting, mainly through training and awareness creation, and by providing preprinted reporting formats, envelops, and required prepaid stamps. Little or no improvements have been achieved. Probably, this could emanate from systemic and structural weakness of the reporting process, which centers mainly on *woreda* direct report to the Federal Authority i.e., to the APHRD, sometimes without the knowledge and consensus of Regional Authorities who have a direct control over the public staff in their areas. The deliberations and the resultant 12-point recommendations made on the workshop of March 16, 2010 organized by the APHRD (Yearbook, 2010) appear not to have been heeded by the relevant actors, as no improvement was visible. It appears that the issue of reporting requires some type of re-assessment and adjustment accordingly. The Competent Authorities in Regions should bear full responsibility for overseeing and ascertaining that this national and international commitment is properly addressed in their region. They may assign a competent person(s) to monitor and take all the necessary actions for realizing regular reports on animal diseases of the areas under their jurisdiction.

The direct communication of information (reports and other issues related to disease occurrence or outbreak) between the HQs at the APHRD and *woredas,* in essence is appreciable, but lack practicality and reliability. *Woredas* are marred with a host of problems in their animal health delivery, as they are, among others, underfunded in field allowances, ill-equipped with transport and communication facilities and many of them isolated from main road networks.

These problems could be significantly alleviated if the Regional Authorities are allowed to be in full charge for the issue and assign competent personnel and essential logistic services for the task of disease reporting and associated activities. Alternatively, federal officers with all essential facilities could be assigned in Regional Bureaus of Agriculture in collaboration with Competent Authorities in respective regions to oversee and make sure that disease reports are performed as required.

Reporting rates of diseases over the past five years from different Regional States are presented in Table 9 below.

**Table 9: Animal disease reporting by different Regional States over five years, 2007-2011.**

| Animal disease reporting rates of different Regions in Ethiopia | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Regions | No. *woredas* | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | **Overall reporting rate %** |
| | | No.reports | Reporting rate % | No reports | Reporting rate% | No. reports | Reporting rate % | No. reports | Reporting rate % | No. reports | Reporting rate % | |
| Addis Ababa | 10 | 41 | 34.16 | 33 | 27.5 | 17 | 14.16 | 49 | 40.83 | 51 | 42.5 | **31.83** |
| Afar | 30 | 14 | 3.90 | 51 | 14.16 | 47 | 13.05 | 18 | 5 | 19 | 5.28 | **8.28** |
| Amhara | 143 | 552 | 32.18 | 858 | 50 | 575 | 33.51 | 563 | 32.80 | 403 | 23.48 | **34.39** |
| B. Shangul | 25 | 45 | 15 | 33 | 11 | 15 | 5 | 33 | 11 | 36 | 12 | **10.8** |
| Dire-Dawa | 1 | 2 | 16.66 | 3 | 25 | 0 | 0 | 5 | 41.66 | 1 | 8.33 | **18.33** |
| Gambella | 15 | 0 | 0 | 19 | 10.55 | 21 | 11.66 | 27 | 15 | 48 | 26.66 | **12.78** |
| Harari | 2 | 4 | 16.66 | 8 | 33.33 | 0 | 0 | 0 | 0 | 2 | 8.33 | **11.66** |
| Oromia | 319 | 1505 | 39.31 | 1756 | 45.87 | 2145 | 56.03 | 2461 | 64.29 | 1793 | 46.84 | **50.47** |
| SNNP | 139 | 328 | 19.66 | 465 | 27.88 | 290 | 17.38 | 301 | 18.04 | 250 | 14.99 | **19.59** |
| Somali | 53 | 21 | 3.30 | 12 | 1.88 | 13 | 2.04 | 73 | 11.48 | 31 | 4.87 | **4.71** |
| Tigray | 36 | 102 | 23.61 | 131 | 30.32 | 116 | 26.85 | 219 | 50.69 | 126 | 29.16 | **32.13** |
| **Total** | **773** | **2614** | **28.18** | **3369** | **36.32** | **3239** | **34.92** | **3749** | **40.41** | **2760** | **29.75** | **33.92** |

Source: Adapted from APHRD (Gulima, 2011) presented on VACNADA workshop, 05-07 December, 2011, Debre-Zeit, Ethiopia

Overall disease reporting rate over the 5-year period was very low (33.92%) ranging between 28.18 % in 2007 and 40.41% in 2010.

The least rate of disease reporting was from Somali Regional State with overall 4.71%, and the highest reporting rate was from Oromia Regional State with an overall 50.47% reporting during the five year period. All these figures are below the required OIE standards of at least 80% reporting rate.

Major diseases reported are summarized in Tables 10, 11, 12, and 13. Figure 4 depicts the share of the different diseases during the reporting period of 2010-2011, and Figure 5 the outbreak frequency, effect and trend over a four-year period.

The perusal of information depicted in these tables indicates that in the majority of cases, same diseases are being reported as causes of outbreaks. However, as most reports are not corroborated by laboratory tests, some of these diseases could, potentially, be other diseases with similar clinical manifestations.

Looking at this information in the four tables from FY 2007-2008 to FY 2010-2011 and Figure 5, it appears that the number of disease outbreaks is on the decline. 4852 disease outbreaks were reported in 2007-2008, whereas it was halved to 2669 in 2010-2011. Disease cases did not show such a clear trend, but that of 2010-2011 was significantly lower than in previous

years. The highest cases were reported in 2008-2009 amounting to 167054, while that of 2010-2011 were only 77153. The highest deaths or mortalities were reported during the period 2007-2008 calculated at 47518 head of animals. 2009-2010 and 2010-2011 reports contained lower death rates than other years.

The great majority of diseases reported are not confirmed by laboratory tests. This cannot be justified and should not be allowed to continue, as there are well distributed and reasonably competent RVL and FVL to provide the necessary diagnostic services. Field Veterinary Services should be encouraged to send appropriate samples in time and the diagnostic laboratories should reciprocate with result feed-back in reasonable timeline, which in itself constitutes an incentive for further inflow of sample throughputs.

It would be difficult to unravel the causes of these variations, and if these variations are real, or rather man-made differences reflecting variation in reporting efficiency. However, some improvements in animal health delivery are expected to contribute to some of these differences.

One important indication about disease reports in Ethiopia is the stagnation of reporting rates around 30-40%, which could imply that only certain *woredas* of the currently recognized 773 (this figure varies continuously) are reporting while the rest are either unable due to difficulties of communication and other prevailing conditions, or are unwilling to do the job.

This important issue is under critical examination by all relevant stakeholders and the APHRD is committed to do all it takes for conclusive resolution of the problem to enhance the country to stand as a reliable player and contributor to international regulations and standards and to enjoy its livestock resource potentials and opportunities at national and international perspectives.

**Table 10: Major animal disease outbreaks reported to the APHRD during 2010-2011 FY (2002-2003 ETH FY)**

| Animal disease outbreaks of 2011 in Ethiopia | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Disease** | **Outbreaks** | **Cases** | **Deaths** | **Slaughtered** | **PAR*** | **Morbidity, %** | **Mortality ,%** | **Case fatality, %** |
| **AHS** | 208 | 3036 | 1167 | 3 | 712166 | 0.426 | 0.001 | 0.38 |
| **ANT** | 427 | 4441 | 1453 | 497 | 1553462 | 0.286 | 0.001 | 0.33 |
| **BAB** | 1 | 1 | 0 | 0 | 1600 | 0.063 | 0 | 0 |
| **BQ** | 534 | 6752 | 934 | 111 | 1934781 | 0.349 | 0.000 | 0.12 |
| **CBPP** | 50 | 1891 | 326 | 33 | 600228 | 0.315 | 0.001 | 0.17 |
| **CCPP** | 21 | 2302 | 866 | 74 | 237129 | 0.970 | 0.004 | 0.37 |
| **CPOX** | 5 | 1136 | 10 | 0 | 40740 | 2.788 | 0.000 | 0.01 |
| **CSF** | 1 | 43 | 43 | 0 | 400 | 10.75 | 0.107 | 1 |
| **EHV-1** | 6 | 262 | 34 | 0 | 2434 | 10.764 | 0.014 | 0.13 |
| **FCHO** | 6 | 336 | 72 | 0 | 108775 | 0.309 | 0.001 | 0.21 |
| **FMD** | 98 | 17577 | 736 | 481 | 1517833 | 1.158 | 0.000 | 0.04 |
| **FTYP** | 3 | 99 | 43 | 0 | 2090 | 4.737 | 0.020 | 0.43 |
| **HS** | 600 | 10613 | 2517 | 391 | 2487723 | 0.427 | 0.001 | 0.24 |
| **LSD** | 241 | 7703 | 657 | 38 | 3095458 | 0.249 | 0.000 | 0.08 |
| **MCF** | 4 | 35 | 16 | 3 | 5475 | 0.639 | 0.003 | 0.46 |
| **ND** | 84 | 10371 | 3409 | 901 | 645008 | 1.608 | 0.005 | 0.33 |
| **PPR** | 116 | 3714 | 1317 | 122 | 1000152 | 0.371 | 0.001 | 0.35 |
| **RAB** | 40 | 443 | 244 | 21 | 55963 | 0.792 | 0.004 | 0.55 |
| **SGPX** | 218 | 6353 | 998 | 95 | 1520930 | 0.418 | 0.001 | 0.16 |
| **STRE** | 4 | 12 | 4 | 2 | 2067 | 0.581 | 0.002 | 0.33 |
| **TRYP** | 2 | 33 | 18 | 0 | 2123 | 1.554 | 0.008 | 0.54 |
| **TOTAL** | **2669** | **77153** | **14864** | **2772** | **15526537** | **0.497** | **0.001** | **0.19** |
| ***PAR denotes population at risk** | | | | | | | | |

Source: Compiled and arranged from APHRD data base, 2011.

Key: AHS= African horse sickness, ANT= anthrax, CSF= classical swine fever, BAB= babesiosis, BQ= black-quarter, CBPP= contagious bovine pleuropneumonia, CCPP= contagious caprine pleuropneumonia, CPOX= cowpox (camelpox?), EHV-1= equine herpes virus type 1, FCHO= fowl cholera, FMD= foot and mouth disease, FTYP= fowl typhoid, HS= hemorrhagic septicemia, LSD= lumpy skin disease, MCF= Malignant catarrhal fever, ND= Newcastle disease, PPR= peste des petits ruminants, RAB= rabies, SGPOX= sheep and goat pox, STRE= streptothricosis, TRYP= trypanosomosis

Figure 4: Pie chart showing the share of each disease in the overall occurrence of outbreaks in Ethiopia in 2011

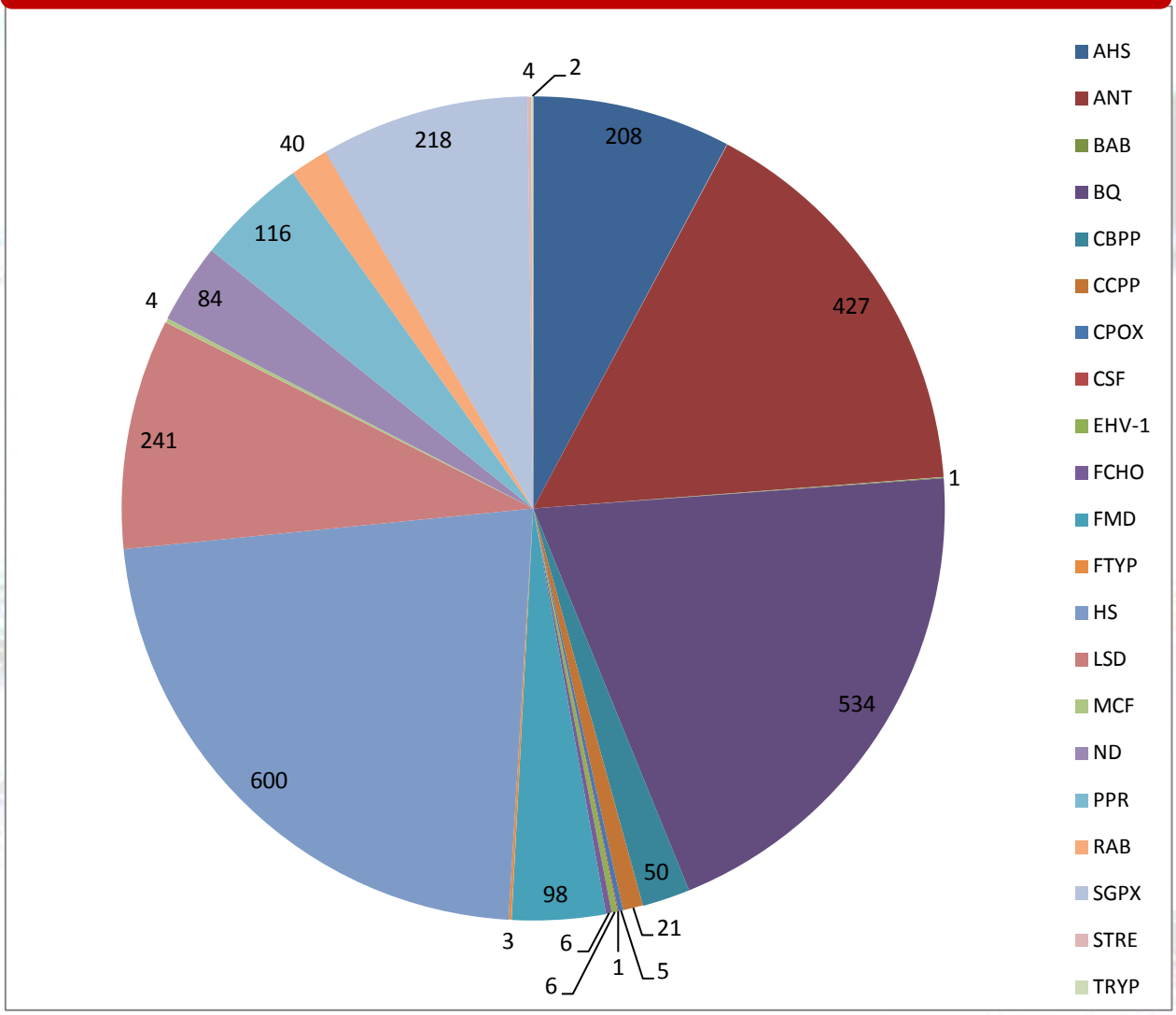


**Table 11: Summary of disease outbreak reports during 2009-2010 FY**

| No. | Diseas | Confirmed | Suspecte | Total OB | New Cases | Deaths | PAR | Morb Rate | Mort Rate |
|---|---|---|---|---|---|---|---|---|---|
| **1** | HS | 0 | 1104 | 1104 | 17096 | 3381 | 2952328 | 0.6% | **0.1%** |
| **2** | BQ | 0 | 789 | 789 | 9435 | 1240 | 2429729 | 0.4% | **0.1%** |
| **3** | ANT | 1 | 680 | 681 | 4523 | 1772 | 1761990 | 0.3% | **0.1%** |
| **4** | SGPX | 1 | 388 | 389 | 6522 | 1008 | 2177741 | 0.3% | **0.0%** |
| **5** | LSD | 0 | 276 | 276 | 9851 | 888 | 1777783 | 0.6% | **0.0%** |
| **6** | AHS | 0 | 165 | 165 | 11717 | 494 | 348028 | 3.4% | **0.1%** |
| **7** | PPR | 0 | 160 | 160 | 21516 | 1279 | 844398 | 2.5% | **0.2%** |
| **8** | RAB | 0 | 59 | 59 | 325 | 222 | 82597 | 0.4% | **0.3%** |
| **9** | FMD | 0 | 173 | 173 | 33651 | 169 | 1758953 | 1.9% | **0.0%** |
| **10** | NCD | 0 | 90 | 90 | 3746 | 1565 | 313867 | 1.2% | **0.5%** |
| **11** | CBPP | 0 | 43 | 43 | 1182 | 224 | 532169 | 0.2% | **0.0%** |
| **12** | CCPP | 0 | 15 | 15 | 1902 | 546 | 91200 | 2.1% | **0.6%** |
| **13** | TRYP | 0 | 1 | 1 | 115 | 15 | 2500 | 4.6% | **0.6%** |
| **14** | FCHO | 0 | 17 | 17 | 1170 | 539 | 337218 | 0.3% | **0.2%** |
| **15** | STRE | 0 | 3 | 3 | 6 | 2 | 1807 | 0.3% | **0.1%** |
| **16** | BAB | 0 | 1 | 1 | 4 | 3 | 1200 | 0.3% | **0.3%** |
| **17** | MCF | 0 | 2 | 2 | 19 | 12 | 6650 | 0.3% | **0.2%** |
| **18** | FTYP | 0 | 1 | 1 | 35 | 26 | 3675 | 1.0% | **0.7%** |
| **19** | BRUC | 0 | 2 | 2 | 4 | 0 | 3000 | 0.1% | **0.0%** |
| **20** | CE | 0 | 2 | 2 | 80 | 12 | 7662 | 1.0% | **0.2%** |
| **Total** | | **2** | **3974** | **3976** | **122899** | **13397** | **15434493** | **0.79** | **0.08** |

HS = Hemorrhagic septicemia; BQ = Black quarters; ANT = Anthrax; SGPX = Sheep and goat pox; LSD = Lumpy skin disease; AHS = African horse sickness; PPR = Peste des petits ruminants; RAB = Rabies; FMD = Foot and mouth disease; NCD = Newcastle disease; CBPP = Contagious bovine pleuropneumonia; CCPP = Contagious caprine pleuropneumonia; TRYP = Trypanosomosis; FCHO = Fowl cholera; STRE = Streptothricosis; BAB = Babesiosis; MCF = Malignat catarrhal fever; FTYP = Fowl typhoid; CPOX = Cow pox; BRUC = Brucelosis; CE = Contagious echthyma; ANA = Anaplasmosis; AI = Avian influenza; OB = Outbreak; PAR = Population at risk; Morb Morbidity; Mort = Mortality.

Source: Ethiopia Animal Health Yearbook 2009/2010

**Table 12: Summary of animal disease outbreak reports during 2008-2009 FY**

| No. | Diseas | Confirmed | Suspected | Total OB | New Cases | Deaths | PAR | Morb % | Mort Rate |
|---|---|---|---|---|---|---|---|---|---|
| **1** | HS | 0 | 904 | 904 | 20412 | 2976 | 2344541 | 0.9% | **0.1%** |
| **2** | BQ | 0 | 780 | 780 | 9455 | 1401 | 1883951 | 0.5% | **0.1%** |
| **3** | ANT | 0 | 801 | 801 | 44703 | 3170 | 1883647 | 2.4% | **0.2%** |
| **4** | SGPX | 0 | 510 | 510 | 12919 | 1822 | 2055454 | 0.6% | **0.1%** |
| **5** | LSD | 0 | 477 | 477 | 21206 | 1015 | 3001510 | 0.7% | **0.0%** |
| **6** | AHS | 0 | 168 | 168 | 1059 | 545 | 277571 | 0.4% | **0.2%** |
| **7** | PPR | 0 | 126 | 126 | 32919 | 3158 | 663113 | 5.0% | **0.5%** |
| **8** | RAB | 0 | 73 | 73 | 585 | 388 | 88867 | 0.7% | **0.4%** |
| **9** | FMD | 0 | 70 | 70 | 9396 | 121 | 887743 | 1.1% | **0.0%** |
| **10** | NCD | 0 | 38 | 38 | 2987 | 620 | 89602 | 3.3% | **0.7%** |
| **11** | CBPP | 0 | 31 | 31 | 2281 | 1030 | 205093 | 1.1% | **0.5%** |
| **12** | CCPP | 0 | 23 | 23 | 7391 | 4546 | 186643 | 4.0% | **2.4%** |
| **13** | TRYP | 0 | 5 | 5 | 103 | 21 | 4900 | 2.1% | **0.4%** |
| **14** | FCHO | 0 | 10 | 10 | 248 | 2 | 343000 | 0.1% | **0.0%** |
| **15** | STRE | 0 | 5 | 5 | 22 | 5 | 3703 | 0.6% | **0.1%** |
| **16** | BAB | 0 | 2 | 2 | 1360 | 550 | 31000 | 4.4% | **1.8%** |
| **17** | ANA* | 0 | 1 | 1 | 8 | 3 | 2500 | 0.3% | **0.1%** |
| **Total** | | **0** | **4024** | **4024** | **167054** | **21373** | **13952838** | **1.20** | **0.15** |

*ANA= denotes anaplasmosis

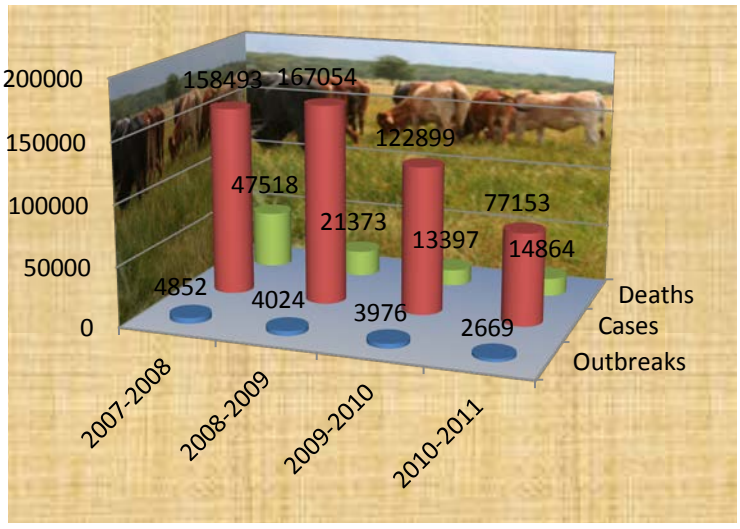
Source: Ethiopia Animal Health Yearbook 2009/2010

**Table 13: Summary of animal disease outbreak reports during 2007-2008 FY**

| No. | Diseas | Confirmed | Suspected | Total OB | New Cases | Deaths | PAR | Morb Rate | Mort Rate |
|---|---|---|---|---|---|---|---|---|---|
| **1** | HS | 6 | 1,243 | 1,249 | 31,277 | 7,376 | 3,620,227 | 0.9% | **0.2%** |
| **2** | BQ | 1 | 983 | 984 | 7,520 | 2,493 | 2,332,255 | 0.3% | **0.1%** |
| **3** | ANT | 2 | 925 | 927 | 7781 | 3002 | 2,081,755 | 0.4% | **0.1%** |
| **4** | SGPX | 7 | 667 | 674 | 50818 | 5005 | 3,696,979 | 1.4% | **0.1%** |
| **5** | LSD | 5 | 357 | 362 | 10289 | 952 | 2,624,086 | 0.4% | **0.0%** |
| **6** | AHS | 2 | 199 | 201 | 3255 | 817 | 323,743 | 1.0% | **0.3%** |
| **7** | PPR | 2 | 188 | 190 | 14746 | 8940 | 2,108,918 | 0.7% | **0.4%** |
| **8** | RAB | 1 | 46 | 47 | 228 | 126 | 39,173 | 0.6% | **0.3%** |
| **9** | FMD | 1 | 44 | 45 | 2538 | 54 | 176064 | 1.4% | **0.0%** |
| **10** | NCD | 1 | 44 | 45 | 12972 | 12264 | 160489 | 8.1% | **7.6%** |
| **11** | CBPP | 2 | 52 | 54 | 7076 | 4108 | 346243 | 2.0% | **1.2%** |
| **12** | CCPP | 1 | 37 | 38 | 8888 | 2068 | 650552 | 1.4% | **0.3%** |
| **13** | TRYP | 0 | 8 | 8 | 266 | 45 | 23672 | 1.1% | **0.2%** |
| **14** | FCHO | 0 | 11 | 11 | 153 | 12 | 217750 | 0.1% | **0.0%** |
| **15** | STRE | 0 | 7 | 7 | 27 | 3 | 24239 | 0.1% | **0.0%** |
| **16** | BAB | 0 | 3 | 3 | 605 | 229 | 32800 | 1.8% | **0.7%** |
| **17** | MCF | 0 | 4 | 4 | 26 | 12 | 6086 | 0.4% | **0.2%** |
| **18** | FTYP | 0 | 1 | 1 | 22 | 10 | 10000 | 0.2% | **0.1%** |
| **19** | CPOX | 0 | 2 | 2 | 6 | 2 | 5000 | 0.1% | **0.0%** |
| **Total** | | **31** | **4821** | **4852** | **158493** | **47518** | **18480031** | **0.86%** | **0.26%** |

Source: Ethiopia Animal Health Yearbook 2009/2010

**Figure 5: Disease outbreaks and effects with trends over four years 2008-2011**



## 3.2. Disease prevention, control and eradication

No one doubts about the importance of disease prevention as opposed to reaction to introduction of a foreign disease or outbreak of endemic diseases. Prevention is the best policy for avoiding the occurrence of disease whenever and wherever this is possible. However, some diseases do not have reliable means of preventing as their mode of transmission and spread is either unknown or difficult to control.

Animal disease prevention, control and eradication in Ethiopia to-date could be considered as a function and responsibility of the public sector. The contribution of the private sector is at its infantile stage, although there is a genuine drive at Federal and Regional levels to improve the private role, especially in clinical services and control of endemic diseases and parasites.

### 3.2.1. Disease prevention

Although there is apparent control and check for International Animal Health Certificate and International Sanitary Certificate at legal entry points for avoiding the incursion of exotic diseases, the possibility of clandestine entry of animals and animal products across the long borders of the country cannot, at least at the moment, be guaranteed as border control for TADs is also not very strong in this large country with rugged terrain. The major arm of disease prevention and control in Ethiopia for some time to come, therefore, is applying quarantine measures whenever a TAD of internal or external origin is detected and ring immunization/vaccination supported by other sanitary and bio-security measures, implying the necessity of emergency planning and preparedness for tackling such events. Immunizing susceptible animals and stockpiling necessary vaccines for potential threats is the strategy that the country is adopting.

The NVI is, therefore, responsible for producing most of vaccines for animal diseases required for any emergency situation and for regular local consumption and has the capacity for producing surplus for export (Tables 14, 15, 16, and Figure 6). However, there is shortage (FMD, CCPP, and rabies). Vaccine production for both local and international markets is steadily growing, which indicates the increasing demand in both situations.

The NVI, as revealed in the 2009-2010 Yearbook, is a holder of IQNet DQS ISO 9001:2008 Certificate. The Institute's role in animal disease prevention, control and eradication is commendable. As mentioned in preceding section, the Institute also provides critical service in animal disease surveillance and diagnosis, training on laboratory techniques, conducting research on improving and developing vaccines, in feed analysis services and in developing diagnostic kits.

Domestic vaccine consumption ranges between 25 million and 40 million doses according to annual vaccination figures of different years. There is a wide margin, from production view point, to increase the foreign trade of most of vaccines under production and intensified promotion effort would seem beneficial. Technology transfer, especially in the area of FMD vaccine production is becoming imperative, as there is already a national and regional plan of controlling this important hurdle of animal production and anathema to livestock and livestock trade on international market.

**Table 14: Types and size (dose) of vaccines produced for domestic consumption during 2008/9-2010/11 FY**

| S/N | Type of Vaccine | Years | | |
|---|---|---|---|---|
| | | 2008/9 | 2009/10 | 2010/11 |
| 1.1 | Bacterial Vaccines | | | |
| 1.1.1 | CBPP | 3,709,500 | 5,201,400 | 4,174,500 |
| 1.1.2 | Anthrax | 5,247,250 | 8,061,100 | 9,114,911 |
| 1.1.3 | Blackleg | 4,213,750 | 6,398,450 | 5,030,000 |
| 1.1.4 | O.Pasteurellosis | 6,146,250 | 6,241,900 | 5,489,800 |
| 1.1.5 | B. Pasteurellosis | 4,354,850 | 4,999,200 | 5,088,700 |
| 1.1.6 | CCPP | 683,000 | 543,712 | 942,100 |
| 1.1.7 | Fowl Thyphoid | 392,300 | 839,700 | 743,500 |
| | **Total** | **24,746,900** | **32,285,462** | **30,583,511** |
| 1.2 | Viral Vaccines | | | |
| 1.2.1 | LSD | 5,372,550 | 5,081,610 | 6,945,200 |
| 1.2.2 | Sheep Pox | 6,134,100 | 8,864,340 | 8,413,100 |
| 1.2.3 | PPR | 7,815,450 | 11,653,850 | 20,359,950 |
| 1.2.4 | FMD | 93,260 | 348,370 | 55,405 |
| 1.2.5 | AHS | 1,249,100 | 1,206,660 | 2,202,650 |
| 1.2.6 | Newcastle | 4,035,950 | 5,411,453 | 6,672,300 |
| 1.2.7 | Fowl Pox | 323,420 | 586,210 | 684,120 |
| 1.2.8 | Gumboro | 519,800 | 1,235,500 | 2,790,450 |
| 1.2.9 | Rabies | 33,185 | 24,922 | 2,015 |
| | **Total** | **25,576,815** | **34,412,915** | **48,125,190** |
| | **G. Total** | **50,323,715** | **66,698,377** | **78,708,701** |

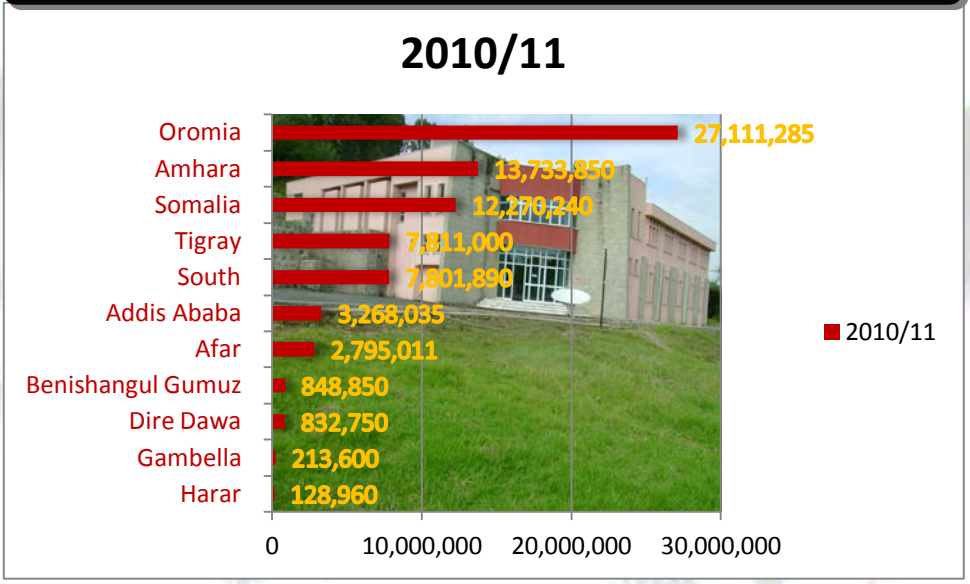
**Table 15: Types and size (dose) of vaccines produced for foreign trade during 2008/9-2010/11 FY**

| S/N | Type of Vaccine | Years | | |
|---|---|---|---|---|
| | | 2008/9 | 2009/10 | 2010/11 |
| 1.1 | **Bacterial Vaccines** | | | |
| **1.1.1** | CBPP | 5,211,700 | 9,668,500 | 10,978,000 |
| **1.1.2** | Anthrax | - | 1,110,000 | 2,120,000 |
| **1.1.3** | Blackleg | 95,000 | 60,000 | 840,000 |
| **1.1.4** | O.Pasteurellosis | - | | - |
| **1.1.5** | B. Pasteurellosis | 109,000 | 125,000 | 875,000 |
| **1.1.6** | CCPP | 58,000 | 143,200 | 2,000 |
| | **Total** | **5,473,700** | **11,106,700** | **14,815,000** |
| **1.2** | **Viral Vaccines** | | | |
| **1.2.1** | LSD | 3,290,100 | - | 725,000 |
| **1.2.2** | Sheep Pox | 918,000 | 1,202,000 | 150,000 |
| **1.2.3** | **PPR** | 10,315,000 | 6,300,000 | 1,962,600 |
| **1.2.4** | Newcastle | 12,500,000 | 56,700.0 | 32,898,650 |
| | **Total** | **27,023,100** | **7,558,700** | **35,736,250** |
| | **G.Total** | **32,496,800** | **18,665,400** | **50,551,250** |

**Table 16: Amount of vaccines distributed to different Regions during 2008/9-2010/11**

| Region | Vaccines in Dose per Fiscal Years | | |
|---|---|---|---|
| | **2008/9** | **2009/10** | **2010/11** |
| **Tigray** | 6,452,360 | 3,368,450 | 7,811,000 |
| **Afar** | 4,874,450 | 2,145,400 | 2,795,011 |
| **Amhara** | 8,873,039 | 9,846,070 | 13,733,850 |
| **Oromia** | 17,229,850 | 21,444,112 | 27,111,285 |
| **Somalia** | 6,305,200 | 13,902,250 | 12,270,240 |
| **Benishangul Gumuz** | 326,100 | 468,650 | 848,850 |
| **South** | 4,055,420 | 10,071,220 | 7,801,890 |
| **Dire Dawa** | 93,900 | 395,280 | 832,750 |
| **Gambella** | 503,250 | 960,000 | 213,600 |
| **Harar** | - | - | 128,960 |
| **Addis Ababa** | 417,246 | 2,139,165 | 3,268,035 |
| Total | **49,130,815** | **64,740,597** | **76,815,471** |

**Figure 6: Vaccine distribution (dose) to Regions in 2011 FY**




### 3.2.2. Disease control

Disease control in Ethiopia is also dominated by prophylaxis, but chemoprophylaxis and chemotherapy have wider roles.

While selected diseases are planned and coordinated by the Federal Government with collaboration and support of Regional Authorities, the bulk of animal disease and other animal health problem control activities are performed by local public veterinary clinics with support of diagnostic RVLs, as well as other non-governmental organizations (NGOs) and private clinics.

The VACNADA project (018/AU-IBAR/2010/VACNADA) signed on 4 October, 2010 between AU-IBAR and FDRE, coordinated by the AU-IBAR and funded by EU with a budget of €1,201, 526, mentioned under Disease Surveillance earlier, is one of the nationally planned and executed disease control activities. It performed vaccination of 5 million head of shoats against PPR and 1.84 million goats against CCPP during the 2010-2011 in eight Regional States. Significant capacity building work has also been performed in areas of field, laboratory and office equipment and in staff training. Some Birr 3,899,999 was consumed by the project

During and prior to the 2010-2011 budget year the APHRD together with the NAHDIC were involved with the preparatory phase of developing a national program for controlling ecto-parasites in sheep and goats, which constitute among the top causes of skin rejection in external trade and consequential heavy economic losses. All the pre-launching procedures have been completed and the MoA has commenced the operation as of January 2012 (activities underway at the time this document is being prepared) through assigning the NAHDIC for nationally coordinating the program planned to last for five years and targeted to contribute to leather external trade of US$500 million at the end of Five Year Growth and Transformation Plan (GTP), in 2015.

Many of the T&T affected Regions (Amhara, Oromia, SNNP and Benishangul-Gumuz) have been implementing control programs during 2010-2011 FY, particularly in areas of new resettlement schemes

### 3.2.3. Disease eradication

The Ethiopian Government, the animal health personnel and particularly the livestock breeders have still fresh memory of what a threat and curse rinderpest had been to the health of livestock populations and to the livelihood of the whole country's inhabitants. The success of eradicating rinderpest should serve as a springboard to take-on another serious animal disease for repeating the success story.

Currently, only one disease is under eradication scheme, and that is the Southern Tsetse Eradication Project (STEP). It involves an area of 25000-30000 in the southern Rift Valley of Ethiopia infested by *Glossina pallidipes* and a very restricted population of *G.fuscipes fuscipes.* As briefly discussed in the preceding Animal Health Yearbook 2009/2010, this project was a joint venture between the FDRE and the International Atomic Energy Agency (IAEA) that commenced functioning in 1997. The two components of the project, i.e. fly control/eradication field operation and fly mass-rearing plant have continued in the 2010-2011 FY.

Up until now, fly suppression and disease treatment at the field and mass-rearing of the two species at the Kalitti fly mass-rearing plant are being carried out together with other relevant activities such as staff training, equipment acquisition and surveillance and monitoring of the field activities. As the fly colony at the mass-rearing facility has not been grown to the desired level, sterile fly release operation proper, apart from test releases, could not be undertaken to-date. Fly suppression activities using insecticide treated animals and target screens have continued over the 25000 $km^2$ of the project area and survey has been conducted over additional 35000 $km^2$ to expand the project activities in new areas. Sequential aerosol technique (SAT) is being considered to be used in the control and eradication operation.

Ethiopia's infrastructural resources are still not adequate to deliver animal health care to the required standards at all levels. There still exists wide margin for improvements and the trained and skilled manpower resource ratio to that of livestock size is low. Essential facilities and equipment are still not fully adequate and not of the highest standards.

As a developing country, however, the infrastructural and financial resource that Ethiopia is allocating to animal health sector is considerable. For ensuring better animal health, food safety, and emergency response to animal health threats and for enhancing animal and animal products foreign trade, the APHRD, Regional Authorities and other stakeholders are all committed to work hard and develop animal health delivery to the required standards.

For discharging these duties and responsibilities, some 800 professionals, of whom more than 660 are veterinarians with varied specializations, 7156 veterinary papa-professionals are involved at different capacities all over the country (Table 17). More than 2600 community-based animal health workers (CAHWs) also deliver animal health services, particularly in pastoralist areas where public and private services are weak. Manpower status is a dynamic condition which varies from day to day, month to month and year to year. The trend, nevertheless, is on constant increase and this increase is expected to step up with the new national plan, the five-year GTP of the country in order to achieve the highly set (ambitious, but achievable with appropriate management and implementation provisions and dedication of all actors) objectives from the animal health point of view.

Activities of animal health staff are mainly based in the field for clinical and ambulatory services, but veterinary laboratories and public health services (Inspection and quarantine) also engage many veterinary professionals and paraprofessionals. Animal health staff is also based at Federal and Regional Offices to provide regulatory, technical and management services.

Major institutional facilities are presented in Table 18, but these also vary from time to time, particularly considering animal health posts and veterinary drug shops and stores.

**Table 17: Manpower size and qualifications in animal health services of Ethiopia**

| Post | Qualification | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Veterinarian** | **AHO(BSc)** | **Lab.Tecno(BSc)** | **AI Tecno (BSc)** | **AHA** | **MI** | **LT** | **AHT** | **AIT** | **CAHW** |
| **Federal** | 8 | 1MSc | | | | 20 | | | | |
| **Oromia Region** | 220(12 DVM+MVS) | 20 | 9 | 5 | 2434 | 122 | 12 | 151 | 115 | |
| **Amhara Region** | 160 (77) | 40 | | | 228 | 30 | 31 | 326 | 303 | 302 |
| **Afar Region** | 27(3MVSc and 1PhD) | 2 | | | 79 | | 4 | 254 | | 616 |
| **BSG Region** | 11 | 1 | 2 | | 63 | | 1 | 122 | 3 | |
| **Somali Region** | 26 | 2 | | | 190 | 1 | 4 | 701 | 4 | 907 |
| **SNNP Region** | 180 | | 31 | 62 | 1035 | 110 | 20 | 481 | 96 | 500 |
| **Tigrai Region** | 22 | | | | 50 | 9 | | 127 | | 256 |
| **Gambella Region** | | | | | | | | | | |
| **Harari** | 2 | | | | 8 | 2 | 1 | | 1 | |
| **Addis Ababa** | | | | | | | | | | |
| **Dire-Dawa** | 5 | | | | 18 | | | | | 28 |
| **Total** | **661** | **66** | **42** | **67** | **4105** | **294** | **73** | **2162** | **522** | **2609** |

**Legend:** AHO=animal health officer, Lab Tecno= laboratory technologist, AI Tecno.= artificial insemination technologist, AHA= Animal health assistant, MI= Meat inspector, LT= laboratory technician, AHT= animal health technician, AIT= artificial insemination technician, CAHW= community-based animal health worker

**Table 18: Animal health infrastructure in Ethiopia with their spatial distribution.**

| Fed/Region | FV L | RVL | Wor.vet clinics | S. woreda vet clinic | AHP | AI site | Pr. Wor clinic | Pr. SWor.clinic | Pr.drug shop | QS | Export Abattoir | High level domest. abattoir | Medium level domest. Abattoir | Rural abattoir |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Federal** | 4* | | | | | | | | | 8 | 12** | | | |
| **Oromia Region** | | 4 | 233 | 914 | | | | 27 | 291 | | | 7 | | 84 |
| **Amhara Region** | | 2 | 134 | | 847 | | | 8 | 210 | | | 5 | 10 | 10 |
| **Afar Region** | | 1 | 28 | | 59 | | | | 5 | | | | | 1 |
| **BSG Region** | | 1 | 20 | 106 | | | | | | | | | | 1 |
| **Somali Region** | | 1 | 36 | | 43 | 1 | | | 60 | | | 1 | 1 | 1 |
| **SNNP Region** | | 2 | 93 | | 40 | 154 | 112 | 525 | 24 | | | - | 20 | 90 |
| **Tigrai Region** | | 1 | 99 | | 153 | 33 | 3 | | 14 | | | 4 | 15 | 6 |
| ***Gambella Region** | | 1 | | | | | | | | | | | | |
| **Harari Region** | | | 5 | 6 | 5 | 1 | 1 | | 2 | | | 1 | | 2 |
| **Addia Ababa** | | | | | | | | | | | | | | |
| **Dire-Dawa** | | 1 | 1 | | 16 | | | | 7 | | | | | 28 |
| | **4** | **14** | **649** | **1026** | **1163** | **189** | **116** | **560** | **613** | **8** | **12** | **18** | **46** | **223** |

*One laboratory (quality control) is under advanced stage of construction.
**Three new Export abattoirs are at different stages of development.
***Gambella Regional Veterinary Laboratory has remained non-functional for some time.
Key: FVL=Federal Veterinary Laboratory, RVL= Regional Veterinary Laboratory, Wor.vet= *woreda* veterinary, S.= sub, AHP= animal heath post, AI= artificial insemination, Pr.= private, QS= quarantine station
High level domestic abattoir= facility with capacity of slaughtering 40 cattle or 400 shoats/day
Medium " " " = " " " " " 20-30 " " 200-390 " "
Small level or rural " = " " " " " less than 20 cattle or less than 200 shoats

## 3.3. Emergency preparedness and response

It has become common to see new diseases emerging almost every year. In the last thirty or so years, new human diseases, such as acquired immunodeficiency syndrome (AIDS), Lassa fever, and Ebola have emerged (Otte *et al.*. 2004) and zoonotic diseases, including avian flu, Nipah, and bovine spongiform encephalopathy (BSE) or mad cow syndrome, and equine morbillivirus could be cited according to these authors. New biotypes of known diseases have also emerged, such as hypervirulent form of Gumboro disease, West Nile fever expanding out of its traditional noso-areas, blue tongue in Europe and RVF in Saudi Arabia (*vide supra)*. All these conditions call for a strong and effective early warning and emergency preparedness and response system or plan for potential emergency action.

As briefly touched upon earlier under disease prevention, excluding TADs from crossing national borders by land or air would practically be difficult for Ethiopia and, for that matter, for any other country, although island nations such as United Kingdom and Australia may risk less. This situation makes early warning, emergency preparedness and response plan imperative for avoiding and, when this is impossible, limiting the damage that any serious animal health problem of internal or external origin could sustain on livestock and people of Ethiopia should it occur at any one time.

The 2009/10 Animal Health Yearbook has highlighted the emergency preparedness and response plan, or emergency contingency plan for FMD, rinderpest, RVF and HPAI. The situation has not changed since and the plans and prerequisites for emergency action remain in place for these diseases.

Although rinderpest is now considered as globally eradicated disease, complacency should not deter vigilance on potential disease outbreak either from wittingly or unwittingly releasing the virus from laboratories or from relict foci in wildlife despite the minimal potential of such a chance to occur.

Targeted surveillance in elevated risk areas are being conducted from time to time to follow overall developments relating to these diseases and others that may be encountered.

Access to emergency fund has been assured by the Government on the overall emergency and response plan of the MoA against TADs, flood, crop pest and forest fire, but there is no legislative provision and no specific fund ear-marked for animal health emergency.

# 4. INSPECTION AND QUARANTINE

The major activity of veterinary public health is inspection and quarantine directed toward ensuring the safety and wholesomeness of animal and animal products destined for human consumption whether it is for domestic or foreign customers.

Inspection and quarantine are also the first line of defense against incursion of exotic diseases and against spread of local disease outbreaks.

Inspection in abattoirs is conducted under two sets of conditions. Inspection in municipality abattoirs and other animal slaughter facilities for local consumption falls under the mandate of Regional Authorities, whereas inspection in export abattoirs and at live animal quarantine stations falls under the realm of the Federal Government represented by the APHRD of the MoA.

It is estimated that some 7% of cattle population of the country are slaughtered per year of which only 28% are slaughtered officially, while the rest 72% are slaughtered at the backyard unofficially (Etter, 2005). With the current population estimates, this could be translated to 3,679,900 head of animals being slaughtered per annum of which only 1,030,372 are official while the balance, i.e. 2,649,528 are slaughtered at backyards unofficially. It is important to note that the size of slaughter animals is on the increase both for domestic and for foreign consumption (*vide infra*, PM inspection) and the figure presented in the preceding sentences may not be valid today. Human population increase and increased number of export abattoirs (only five before and more than eight today) could support this assertion.

## 4.1. Meat inspection

Meat inspection service for local consumption is provided in some 287 big, medium and rural slaughterhouses. Detail of ante-mortem and post-mortem inspection is difficult to access, but may not significantly vary from those performed in export abattoirs apart from some variation in rejection or condemnation due to parasitic cysts which, under local conditions, may be treated and allowed for consumption.

Only meat inspection details of export abattoirs shall be described in this document.

### 4.1.1. Ante-mortem inspection in export abattoirs

A total of 2202868 animals were Ante-mortem (AM) inspected during the period, but animals failing this inspection were not revealed (Table 17).

### 4.1.2. Post-mortem inspection

Of the 2,202,868 animals that passed AM inspection in the seven export abattoirs during the 2010-2011 FY 1,913,383 passed post-mortem inspection. The balance was rejected as unfit for various reasons. The largest rejects were recorded by ELFORA Debre-Zeit with 83096 head rejected including 930 bovine carcasses and 82166 shoats. Luna rejected fewer carcasses than the others, and there is no sufficient reason to justify this. Luna may have purchased and slaughtered animals in better conditions. Abergele also had few rejects, but it also slaughtered fewer animals than the others during the period under consideration.

There is a 45.57% increase over the 2009-2010 export figures and this incremental propensity appears to continue.

Luna and Modjo Modern are leading in the size of slaughter throughput and output as could be judged from Table 19. In slaughter of beef Abergele abattoir takes the lead followed by ELFORA Debre-Zeit.

As could be discerned from Table 19, most of the slaughter animals are shoats (mainly goats and sheep in this order) and cattle with very limited number of camels. Most of the abattoirs export hot quartered chilled meat and mutton, including goat meat. Abergele Abattoir exports deboned and frozen meat and mutton.

**Table 19: Total number of animals inspected passed and rejected by ante- and post-mortem inspection and other activities**

| AM inspection | Abattoirs | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Luna | Modjo Modern | Organic | ELFORA DZ | Hashim | ELFORA Matahara | Abergelle | Total |
| Cattle | 544 | | 1 | 3560 | 1002 | | 12962 | 18069 |
| Sheep | | | 69490 | 44019 | | | 10234 | 123743 |
| Goat | | | 184333 | 152045 | | | 329 | 336707 |
| Shoats | 582395 | 534016 | 80907 | 121634 | 360158 | 44803 | | 1723913 |
| Camel | | | | | 436 | | | 436 |
| Sub-total | 582939 | 534016 | 334731 | 321258 | 361596 | 44803 | 23525 | 2202868 |
| PM inspection | | | | | | | | |
| Cattle | 544 | | 1 | 2630 | 371 | | 12519 | 16065 |
| Sheep | | | 60657 | 24225 | | | 10226 | 95108 |
| Goat | | | 167574 | 123576 | | | 329 | 291479 |
| Shoats | 578500 | 451960 | 71125 | 87731 | 280827 | 40448 | | 1510591 |
| Camel | | | | | 140 | | | 140 |
| Sub-total | 579044 | 451960 | 299357 | 238162 | 281338 | 40448 | 23074 | 1913383 |
| Other activities | | | | | | | | |
| Issuance of H.cert. | 2015 | 1419 | 1147 | 431 | 1084 | 93 | 42 | 6231 |
| H.Cert.fees | 20150 | 14190 | 11470 | 4310 | 10840 | 930 | 420 | 62310 |
| Service fees | 579660 | 451960 | 298697 | 225018 | 281447 | 40267 | 32698 | 1909747 |
| **Total charges** | **599810** | **466150** | **310167** | **229328** | **292287** | **41197** | **33118** | **1972057** |

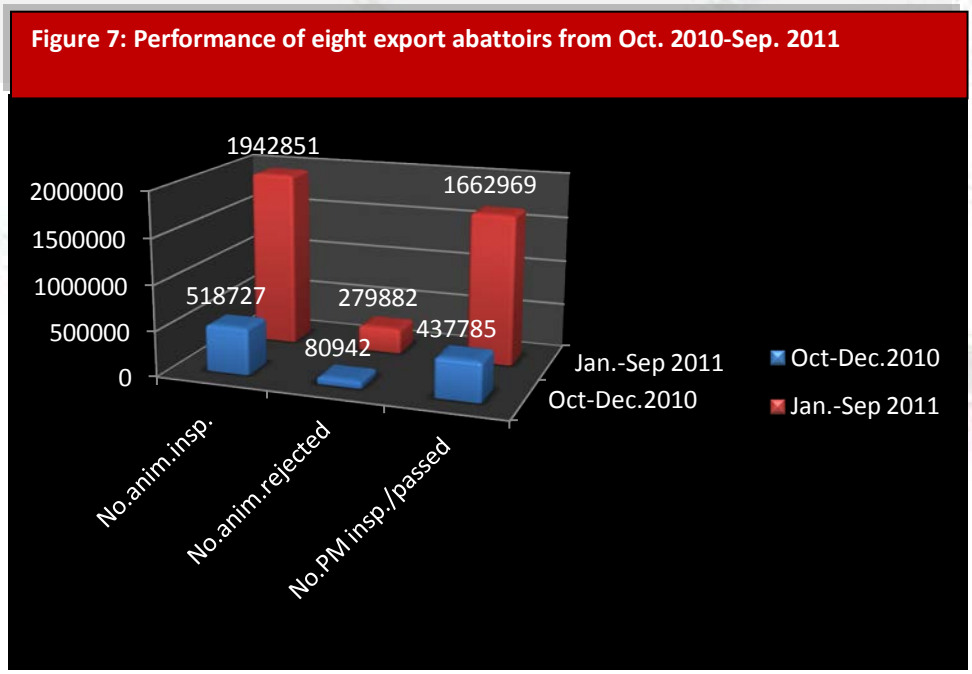
The throughput capacity of these export abattoirs is shown in Table 20. From the accomplishments these abattoirs have achieved during the report year, and from the planned capacity they were designed to perform per day, it appears that most of the abattoirs are working at full capacity. The cattle to shoats slaughter capacity relations are difficult to understand. Some show clear relation of one cattle animal slaughter to equate to 10 shoat slaughter. However, there is discrepancy in the estimation of shoat to cattle slaughter capacity ratio.

**Table 20: Slaughter throughput of export abattoirs**

| SN | Name | Capacity per day | | |
|---|---|---|---|---|
| | | **Cattle** | **Shoats** | **Year Established** |
| **1** | ELFORA Bushoftu (Debre-Zeit) | 20 | 1500 | 1973 |
| **2** | Modjo Modern | | 1000 | 2001 |
| **3** | ELFORA Matahara | | 800 | 2003 |
| **4** | Luna | 46 | 2000 | 2003 |
| **5** | Hashim | 200 | 2000 | 2003 |
| **6** | Organic | 96 | 1500 | 2008 |
| 7 | Aberegele | 240 | 960 | 2009 |

In another performance report, which also include Melge-Wondo abattoir, a 15-month report from October 2010 to September 2011 revealed results depicted in Figure 7.

**Figure 7: Performance of eight export abattoirs from Oct. 2010-Sep. 2011**




In this report, the share of each abattoir is not disaggregated, but presented as sum of all together, with the difference from Table 20 of the inclusion of ELFORA Melge-Wondo in the list. It is now known that a newly established and functioning

Ashiraf Abattoir at Bahr Dar has also commenced functioning during 2011, but information was not made available. Three other abattoirs are under advanced stage of construction and are expected to commence functioning soon.

The fast growth of slaughter houses indicates the Governments strong desire and commitment to develop and expand foreign trade, and further stimulate local leather industry which requires reliable supply of raw materials (hide and skin), while at the same time encouraging value addition to export commodities.

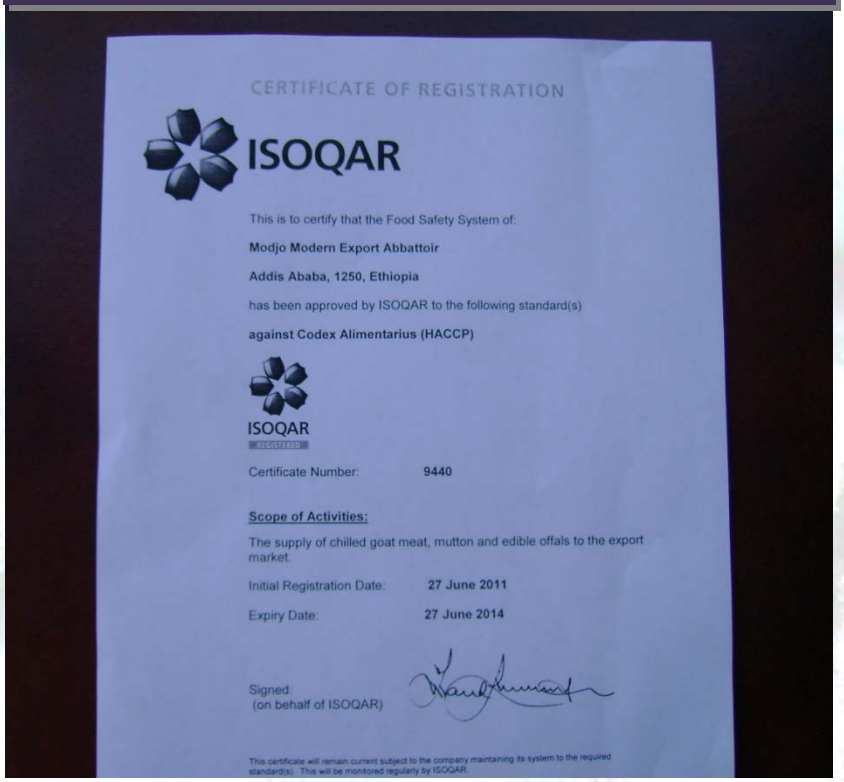
### 4.1.3. Compliance of export abattoirs with national and international standards and requirements

The Ethiopian export or industrial abattoirs have a track-record of seeking harmonization with international standards from their establishment plan through implementation processes. International advises and recommendations were requested from International organizations such as the FAO and the guidelines of Codex Alimentarius Commission (CAC) in establishing and running of the export abattoirs.

The former Ethiopian Livestock and Meat-board (LMB), which was administering export abattoirs, had strong link with the European Commission (former European Economic Community) for approval and access into the their market of meat and meat products prepared in its export abattoirs. Abattoirs such as SOPRAL Asmara and SOPRAL Kombolcha, INCODE Asmara, INCODE Makalle, INCODE Gondor, Melge-Wondo Awasa and Chandris Dire-Dawa were granted admission certificate and were under close scrutiny by experts representing the EU countries to evaluate at yearly intervals the sanitary and quality standards of these abattoirs for retaining, suspending or revoking the admission certificate depending on their performances. The FAO was an active advocate and supporter of harmonizing the Ethiopian export abattoirs through Technical Cooperation Projects (TCPs) particularly in the areas of training meat inspectors and, at times, in technical and financial assistance in building abattoirs, a good example of which is the Debre-Zeit municipality abattoir.

The tradition of compliance with international requirements and standards is continuing into the present day, and this is best exemplified by the introduction of the hazard analysis critical control point (HACCP) principle into Modjo Modern and Luna abattoirs. Modjo Modern has acquired, in 2011, the ISOQAR HACCP accreditation certificate (Figure 8.1 & 8.2) and others will follow suit through introduction of HACCP system into their working areas by acquisition of appropriate facilities and working procedures consistent with HACCP principles that ensures safety, quality and environment-sensitive practices.

**Figure 8.1: ISOQAR Certificate awarded to Modjo Modern Abattoir**



CERTIFICATE OF REGISTRATION

ISOQAR

This is to certify that the Food Safety System of:

**Modjo Modern Export Abbattoir**

**Addis Ababa, 1250, Ethiopia**

has been approved by ISOQAR to the following standard(s)

**against Codex Alimentarius (HACCP)**

ISOQAR

Certificate Number: **9440**

**Scope of Activities:**

The supply of chilled goat meat, mutton and edible offals to the export market.

Initial Registration Date: **27 June 2011**

Expiry Date: **27 June 2014**

Signed:
(on behalf of ISOQAR)

This certificate will remain current subject to the company maintaining its system to the required standard(s). This will be monitored regularly by ISOQAR.

**Figure 8.2: Modjo Modern (from different angles) with ISOQUAR Certificate**

The introduction into the working process and production of HACCP principle has become the main demand of meat and other animal products importing countries, particularly in the Middle East and North Africa (MENA). Ethiopia is responding positively to these demands for mutual benefits in the bilateral agreements, and for harmonizing animal and animal products movement and trade with international standards and requirements as set by the OIE and by the WTO-SPS Agreement, respectively.

The support that Ethiopia is getting from bilateral agreements with friendly countries, and particularly from the United States of America (USA) through the United States Agency for International Development (USAID) via Ethiopia's Sanitary and Phytosanitary Standards and Livestock and Meat Marketing (SPS-LMM) program has played major role for capacity building and the improvement of sanitary and quality conditions of abattoirs and for handling slaughter animals across the export value chain. Various guidelines and standard operating procedures (SOPs) have been prepared on different aspects of slaughterhouse and marketing procedures and distributed to all end-users. Awareness creation and training programs have been carried out at various levels, at both local and global context.

## 4.2. Quarantine services

As discussed in the 2010 publication of Ethiopia Animal Health Yearbook, 12 quarantine stations and check points are in function and more are planned to be added along the borders with Sudan at Almehal and Humera areas.

The establishment of five new quarantine facilities of international standards at Mile-Afar, Kibreahmad-Somali, Almehal-Benishangul-Gumuz, Metema-Amhara and Humera-Tigray Regions has continued, and the three of them are expected to be completed in 2011-2012 FY period. (Together with the establishment of the Quality Control Veterinary Laboratory, Birr 92 million has been allocated for construction, Birr 6 million for procurement of equipment and supplies and Birr 182,000 for recurrent budget from the central treasury of the FDRE Government for these important facilities).

Although complete data could not be available, a partial report on laboratory test and quarantine services conducted during 2010-2011 indicates that more than 338000 animals were tested, or given other essential quarantine services, and were issued International Animal Health Certificate for export.

Improving the hygienic and working conditions of feedlots in and around urban centers in the vicinity of Adama has continued, particularly in the areas of liquid and solid waste disposal and linked foul odor to alter the damaging image of the prevailing operations. There is much to be done yet as the progress is very slow, and improvement is imperative for rendering the livestock international trade competitive in quality and profitability.

# 5. INTERNATIONAL TRADE OF LIVESTOCK AND LIVESTOCK PRODUCTS

Ethiopia is endowed with a diverse wealth of natural resources in terms of bio- and eco-diversities. It could be asserted that these diversities have not been properly utilized to-date in averting natural and man-made shocks that the country suffered at different times in the past. Dependence on limited crops like coffee and oil seeds for foreign exchange earnings, and cultivation of only few varieties of staple food crops, such as teff, sorghum and maize for consumption and cash generation must be shifted to more variety of cash and food crops as well as rearing different livestock suitable to each ecosystem.

An area which has not been fully explored is the huge and diverse livestock resource. Productivity of the national stock is well below the achievable targets recorded in both developed and developing countries. Animal diseases could be cited as the chief contributory factor to this low level of local stock output.

Animal diseases, apart from limiting the productivity of national local herds, are the principal factors for blocking, or restricting biological gains from improved breeds, and for restricting access to international market of animal and animal products from the country.

It is, therefore, of prime priority and necessity to put veterinary and zoonotic diseases under effective control in order to reap the benefits of the great livestock potential that Ethiopia is bearing.

The way forward appears to be a stage-wise tackling of the disease threat by first applying commodity or compartment approach to animals and animal products in the value chain for export as provided by the Terrestrial and Aquatic Animal Health Codes and by the WTO-SPS Agreement on international trade of animals and animal products. Depending on results of this approach, wider regionalization attempts could follow for more access to international markets.

As narrated in the preceding publication of similar Animal Health Yearbook, significant progress has been achieved in the sanitary and working conditions at export abattoirs and in streamlining SPS certification system for live animals, meat and meat products destined for export. The measures that are being implemented are first discussed and agreed upon with authorities and experts from importing countries particularly in the MENA sub-region.

The compartmentalization process for meat and meat product export will be based on applying appropriate quality systems, including the introduction of HACCP in abattoirs and associated processes that will ensure that agents of disease of concern are inactivated and do not carry any risk or are put to the acceptable level of disease risk.

Live animals are put under observation for not less than 28 days in facilities that are separated by biosecurity plan and are tested by competent veterinary laboratories applying OIE prescribed tests on diseases of concern before International Animal Health Certificate is issued for export.

It is appropriate, here, to re-iterate that at least one export abattoir, as mentioned earlier, has acquired HACCP accreditation certificate from ISOQAR and the NAHDIC has been nominated by the FAO and EARLN as the East African Region Referral Laboratory for the diagnosis of avian flu and Newcastle diseases since May 2011. The NAHDIC is recommended for ISO/IEC 17025:2005 accreditation for six diagnostic tests, including FMD, PPR, RVF, Brucellosis, ND and AI

by experts from the South African National Accreditation System after evaluating the laboratories in NAHDIC on 1 September 2011, and from October 17-19, 2011.

These recent developments and the evaluation results of the Performance of Veterinary Services (PVS) of Ethiopia in 2011 can stand as concrete evidence for the validity and reliability of functions performed by the Ethiopian Veterinary Services on animal health in support of safety and quality of animals and animal products of the country destined for domestic and foreign consumption.

Another new development is underway and is almost on final stage of completion. This is the establishment of a quality control laboratory (Figure 9). The laboratory is located in Kalitti, a suburb of Addis Ababa.

**Figure 9: Front façade of the New Quality Contrrol Laboratory (under final stage of construction)**

The establishment and functioning of a quality control facility will offer a new height and new landscape to the Ethiopian Veterinary Services. It will assist the livestock and livestock products access to international trade, particularly by solving the residue problems in food of animal origin and of other products, which have become hot issues on human health and on environmental grounds.

The laboratory is expected to commence functioning within 2011-2012 FY. Undoubtedly, its operation will boost Ethiopia's external trade immensely.

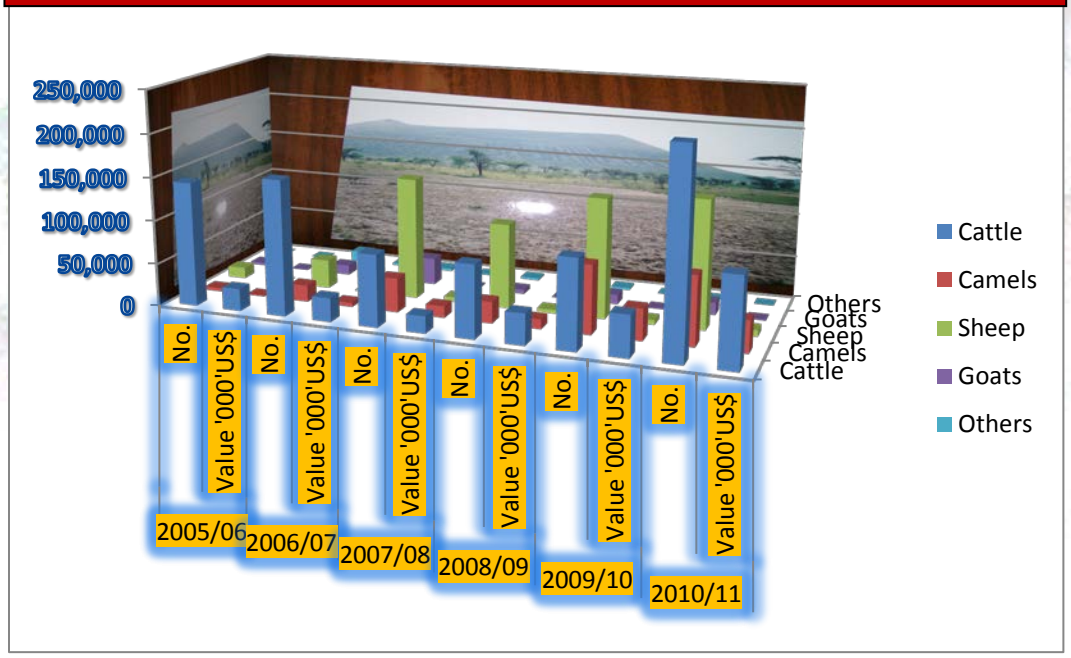
## 5.1. Live animal export

The number of live animal sales, from July 2010 to June 2011 FY, to the neighboring countries of the Sudan and Somalia, and to Middle Eastern countries, according to SPS-LMM report, July 2011, was 472,041 head accounting to 70% of the US$211.1 sale value of both live animal and meat export. This is almost a two-fold increase of the average export figure over the previous five years, which totaled to 1,242,729 head of animals (Animal Health Yearbook, 2010).

**Table 21: Number and value of live animal export by species of animals during 2005/06-2010/11**

| Species | 2005/06 | | 2006/07 | | 2007/08 | | 2008/09 | | 2009/10 | | 2010/11 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Value '000'US$ | No. | Value '000'US$ | No. | Value '000'US$ | No. | Value '000'US$ | No. | Value '000'US$ | No. | Value '000'US$ | No. | Value '000'US$ |
| Cattle | 143,499 | 25,819 | 156,247 | 27,652 | 83,356 | 19,953 | 84,275 | 36,242 | 103,010 | 47,989 | 230,605 | 102,473 | 800,992 | 260,128 |
| Camels | 3,882 | 943 | 19,410 | 4,920 | 39,926 | 13,467 | 25,179 | 11,449 | 79,439 | 36,603 | 79,908 | 37,258 | 247,744 | 104,640 |
| Sheep | 12,857 | 414 | 33,553 | 1,121 | 140,290 | 5,729 | 97,527 | 4,254 | 137,576 | 5,649 | 146,655 | 7,491 | 568,458 | 24,658 |
| Goats | 3,105 | 76 | 11,363 | 316 | 31,197 | 1,205 | 5,182 | 222 | 11,319 | 433 | 14,507 | 650 | 76,673 | 2,902 |
| Others | 32 | 8 | 12,702 | 2,498 | 2,875 | 512 | 2,520 | 525 | 2,408 | 34 | 366 | 6 | 20,903 | 3,583 |
| Total | 163,375 | 27,260 | 233,275 | 36,507 | 297,644 | 40,866 | 214,683 | 52,692 | 333,752 | 90,708 | 472,041 | 147,878 | 1,714,770 | 395,911 |

**Figure 10: Species numbers and their respective value (USD1000) in foreign trade over 2005/6-2010/11**




The export figures of live animals steadily increased, except one case of 2008/09, with that of foreign earnings over the five consecutive years, according to Table 21 and Figure 10 extracted from APHRD documents.

The Sudan and Somalia were first and second in the size of live animal imports from Ethiopia for the purpose of re-exporting to the MENA countries. Sudan imported 107,656 live animals and Sumalia 100,278 head of animals. This situation should be

construed as there being an active cross-border illegal livestock trade with these two countries (and potentially others) due to price differentials, which fuel price inflation of livestock and livestock products in domestic market.

46% of live animal sale pertained to cattle, 35% to sheep, 13% to camels, and only 6% to goats.

## 5.2. Meat export

According to the abovementioned report by the SPS-LMM, July 2011, 16,877 tons of meat has been exported to Middle East countries comprising 30% of the total live animal and meat sales of the US$211.1 million cited above the bulk of which was chilled shoats' carcass accounting to 80% of the volume followed by offal 11%, and beef 9%.

The United Arab Emirates (UAE) stood as the dominant importer (50%) of Ethiopian export meat followed by the Kingdom of Saudi Arabia (KSA) (30%).

# 6. MAJOR ANIMAL HEALTH AND RELATED EVENTS OF 2010-2011

Different events to be considered as landmarks of the Ethiopian Veterinary Services have taken place during the 2010-2011 budget year. These events relate to new infections detected in the country for the first time, newer legislative tools supportive of animal health delivery systems, acquisition of international recognition in crucial areas of animal health services, evaluation of animal health services and related issues and other matters of concern.

## 6. 1. New infections detected

The following animal diseases or infections have been detected for the first time in Ethiopia.

### 6.1.1. Equine encephalosis virus

This is an arthropod-borne disease affecting all species of equine, which is usually manifested in mild form, but could produce serious disease at times with considerable losses. The existence of the virus or infection in Ethiopia was evidenced from samples collected in Kaffa, Mizan and Arsi zones of SNNP (Kaffa and Mizan) and of Oromia Regional States, respectively, in collaboration with experts from the Institute for Animal Health (IAH), Pirbright, UK. The disease or infection is told to exist only in the Republic of South Africa (RSA). The origin and evolution of this disease is not detailed.

### 6.1.2. New FMD topotype detection

New FMD type O topotype was isolated from disease outbreak in Tigray Regional State in November 2011. This topotype was isolated from the outbreak samples in collaboration with colleagues from IAH, Pirbright, UK again, and the isolate belonged to the EA-3 topology and its phylogenetic analysis indicated that the isolate was much related to the Sudan 1999, 2004 and 2008 isolates.

### 6.1.3. Classical swine fever and bovine virus diarrhea infection

The encounter of bovine virus diarrhea may not stimulate much interest as infections are ubiquitous globally, but classical swine fever incident should provoke grave concern for the tiny swine industry in the country and for those who may venture to establish new ones. From the outbreak report, the disease appears to be invariably fatal in those showing clinical signs. 43 out of the diseased 43 animal all died. The source of infection and its evolution is not presented here too, but APHRD and all concerned will follow the case to have clearer picture on the issue to avoid the spread of the disease further afield and to take the necessary action to eliminate it or at least mitigate its damage to the industry.

### 6.1.4. Fish infection with *Yersinia ruckeri* and *Aeromonas hydrophyla*

These agents were isolated from a privately owned aquarium in Bale zone and from the Fisheries Research Center in Sebeta town near Addis Ababa in November and December 2011, respectively. Fish diseases arising from infections by these microorganisms are considered as serious producing heavy economic impact. The origin, temporal and spatial distribution of these agents has not been presented, or rather has not been available to report on this Yearbook.

## 6.2. MoA re-instated for veterinary drug and animal feeds administration and control

Proclamation No. 728/2011, a Proclamation to Provide for Veterinary Drug and Feed Administration and Control was deliberated on in the Parliament during the last quarter of 2011 and published in the *Federal Negarit Gazeta, 18$^{th}$ Year No.14* on 19 January 2012 by which the MoA was re-instated to administer and control veterinary drugs, biologics and animal feeds in the country. This legislative support is believed to have an important bearing on provision of quality, safe

and reliable animal health delivery system. It behoves the animal health services to regain its mandate over its proper domain of duties and responsibilities, and instills confidence to its customers for its services.

## 6.3. Recognition of Ethiopian animal health services by international bodies

### 6.3.1. Nomination of the NAHDIC as East African Regional Referral Diagnostic Laboratory for avian flu and Newcastle diseases

As mentioned earlier in this document, the Eastern Africa Regional Laboratory Network (EARLN) interim secretariat (IS) consisting of the FAO-ECTAD, AU-IBAR, OIE, two representatives from EARLN Member States, the East African Community (EAC), and the Intergovernmental Authority on Development (IGAD) was mandated to deliberate on reviewing of dossiers submitted by applicant countries. These were reviewed on a meeting of the interim secretariat on 9 and 10 May 2011 in Nairobi, Kenya at which it was decided that the NAHDIC be the Regional Referral Diagnostic Laboratory for avian flu and Newcastle diseases.

This is an important milestone for NAHDIC and for Ethiopia in the face of regional and international communities and is expected to improve the country's image on animal health issues, which will have its own impact on international trade of animals and animal products from Ethiopia.

### 6.3.2. ISOQAR HACCP accreditation of Mojdo Modern Export Abattoir

The 2011 has heralded yet happy news for Ethiopian Animal Health Services when it was announced that Modjo Modern was awarded internationally recognized certificate, i.e. ISOQAR Certificate for its introduction and application of HACCP principles in its working system. This is highly expected to boost meat and meat products export, particularly to MENA countries who were demanding for the introduction of HACCP principles into abattoirs from which they receive consignments.

## 6.4. The OIE PVS evaluation results on Ethiopian Veterinary Services

The evaluation of the performance of the Veterinary Services of Ethiopia was undertaken in 2011 by the expert mission from the OIE using PVS Tools. From the 46-point ranking scheme with highest ranking point of 5, the Ethiopian Veterinary Services has scored 2.6 points which stands above average. This is an encouraging result. But the most important issue is the recognition and knowledge of where the country stands at the moment. From this bench mark and from the recommendations made by the evaluating mission, it would be possible to build on what has been achieved so far and make progress to get to the required level(s).

Some of the critical issues and recommendations suggested are presented in an abridged form.

- Veterinary statutory body (VSB) be established as soon as possible by approval of the proposed proclamation before the Parliament
- Recruitment of staff follow a formalized protocol
- Transition to private VS be stepped up by public full recovery of services it provides
- Emergency fund access be supported by legislation
- Compensation in period of emergency be seriously considered since it is globally proven that it is part of requirement for early detection and response mechanism

- Expedite accreditation process for laboratory test and general proficiency tests at NAHDIC and Regional Veterinary Laboratories
- Initiate proficiency testing for priority diagnostic tests
- Laboratory staff concentrate on laboratory tests and analysis, devolving sample collection to field personnel who should get appropriate training of handling samples by the laboratory experts
- Create position dedicated to risk analysis
- Establish protocol for risk analysis to underpin risk-based decisions
- Establish system of traceability consistent with 'from farm to fork' motto.

It must be clear that evaluation for recognition on the different services either by national or international bodies is not a static matter that is a one-off and deal-done operation. It is rather an iterative process that requires upholding of gains and adapting to new situations, be they biological or technological, at all times through sustained commitment, innovation and intelligence information for forecasting what could happen in the future.

## 6.5. Training, working tours, workshops and seminars undertaken in 2010-2011

Various short-term training opportunities, working tours, workshops and seminars or meetings were conducted during the year for different purposes, but all for one ultimate goal of delivering efficient and effective animal health services at all levels. These are summarized in Table 22 below.

**Table 22: Training, workshops, and conferences/meetings undertaken during 2010-2011 FY**

| Type of activity | Subject | No.Participants | Venue/Country |
|---|---|---|---|
| Training (abroad) | Spatial Epidemiology and application of GPS and GIS tools | Two staff members | AU-IBAR, Nairobi, Kenya |
| Training (abroad) | CCPP and PPR diagnostic techniques | 10 staff, 5 from NAHDIC and 5 from Regions | OVI,South Africa |
| Training(local) | VACNADA budget management for regional accountants | More than 60 people | NVI, Debre-Zeit, Ethiopia |
| Workshop (abroad) | Good Emergency Management Practice (GEMP) | Two staff members | Entebe, Uganda |
| Workshop (abroad) | Rapid Alert System For food and Feed (RASFF) | Two staff members | Kenya |
| Workshop | Global Rabies Control Programme | One person | Egypt |
| Confernce (8th global conference) | Animal genetic resources conservation | Two people | Turkey |
| Workshop (local) | VACNADA opening | More than 90 people | Dire International Hotel, Adama, Ethiopia |
| Workshop (local) | Animal health personnel working at abattoirs and quarantine stations | More than 100 people | NVI, Debre-Zeit, Ethiopia |
| Workshop &Meeting (local) | VACNADA closing workshop and consultative meeting with Regional States | More than 80 persons | NVI, Debre-Zeit, Ethiopia |

# 7. MISCELLANY

## 7.1. New boss appointed to navigate the APHRD

Dr Bewket Siraw has been appointed as the Director of APHRD as of the beginning of 2012. The new Director will certainly guide the APHRD to consolidate the gains to-date and will stride for new pages of success at this difficult moment of global economic turbulence using his high professional stature and rich experience.

We wish the new boss good health and a successful directorship for the years to come.

## 7.2. Ministers from North Sudan and KSA and CVO from Jordan pay visit to NAHDIC

Accompanied by His Excellency Tefera Derbew, Minister of Agriculture of the FDRE, His Excellency Dr Fahd A. Balghamaim, Minister of Agriculture of the KSA, His Excellency Dr Feysel Ibrahim, Minister of Livestock and Fisheries of North Sudan and the Chief Veterinary Officer of Jordan paid visit to NAHDIC facility in 2011 (Figure 11).

**Figure 11: NAHDIC guests**

Visitors being briefed by staff member on NAHDIC's activities

The purpose of the visit was to ascertain whether or not there is a reliable and dependable veterinary diagnostic laboratory in Ethiopia for supporting animal health requirements for export animals and animal products. The visitors were satisfied and impressed by what they observed, and showed interest for collaboration to send their staff to the Center for training.

## 7.3. Ethiopia praised for being on course of achieving millennium development goal

Ethiopia has reduced her poverty level from 38.7% to 29.6% in the last few years and is praised by the World Bank and the African Development Fund (ADF) for being within the reaches of achieving the United Nations Millennium Development Goal for Poverty Reduction if her progress continues at current rate.

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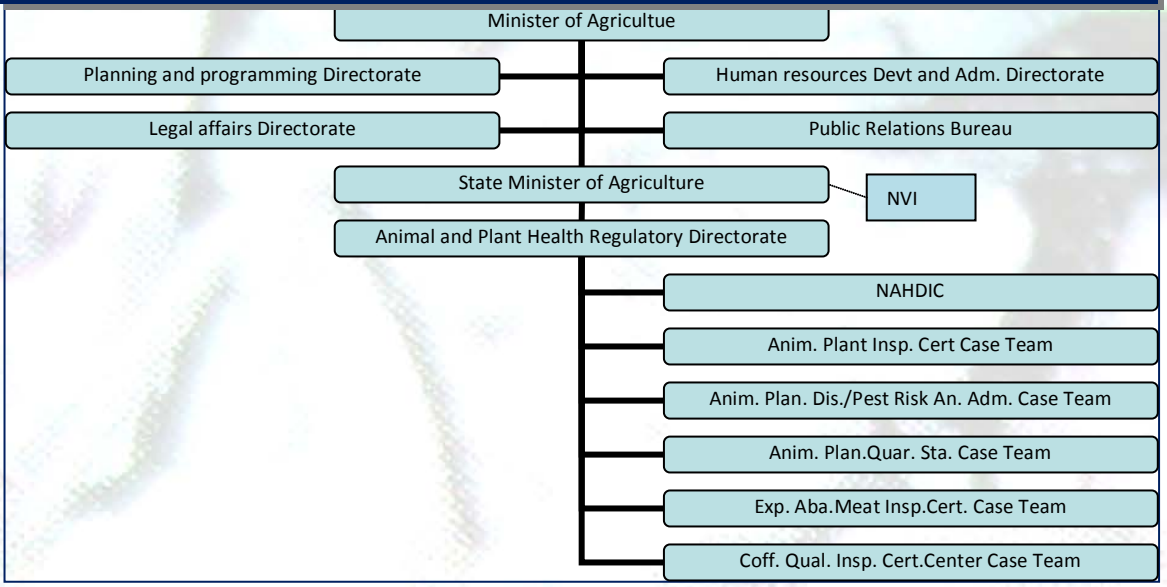
# 9. APPENDICES

## 9.1. Appendix 1: Organizational Structure of the Ministry of Agriculture

**Figure 12: Ministry of Agriculture Organizational Structure and Animal and Plant Health Regulatory Directorate's Position**




Legend: Anim.= animal, insp. = inspection, Cert= certificate, Plan.= plant, Dis.=disease, An.= analysis, Quar.= quarantine, Sta. = station, Exp. = export, Aba. = abattoir, coff. = coffee, Qual. = quality, NVI = National Veterinary Institute, NAHDIC = National Animal Health Diagnostic and Investigation Center.

The Animal and Plant Health Regulatory Directorate is accountable to the State Minister of Agriculture and has one Federal (National) Veterinary Laboratory, the NAHDIC and five case teams as described earlier on in this document. The NVI is not directly accountable to the APHRD but has horizontal advisory or technical link.

Regional Veterinary Services are directly of executively accountable to their respective Regional Authorities, but have signed a MoU to cooperate on technical and administration aspects of animal health control and regulatory services of Federal/National concern.

## 9.2. Appendix 2: Organizational structure of the Quality Control Veterinary Laboratory

The organogram of the Quality Control Laboratory is depicted in Figure 13. The accountability of the laboratory is not yet settled, but some proposals suggest the laboratory to be directly accountable to the Veterinary Drugs and Feed Administration and Control Authority and horizontally to the APHRD of the MoA.

**Figure 13: Organizational Chart of the Quality Control Veterinary Laboratory**


Legend: **Lab and med.= Lab and medical equipment engineering unit; Sample reception= sample reception case team; Data management= Data management unit, or information communication unit; Vacc.& boil. Case= Vaccine and biologice case team; Anim.prod. & anim. Feeds case team= Animal products and animal feeds case team**

The major functions of the laboratory are shown in Figure 14.

**Figure 14: Major functions of the Quality Control Veterinary Laboratory**

## 9.3. Appendix 3: Current federal animal health laboratory service facilities under the MoA

The facilities of the NAHDIC and of the NVI are displayed in Figure 15 and 16, respectively.

### 9.3.1. The National Animal Health Diagnostic and Investigation Center

**Figure 15: Front façade of the NAHDIC laboratories block**

NAHDIC has started building a large ground-plus one separate microbiology laboratory including molecular biology unit within its premises.

### 9.3.2. The National Veterinary Institute

**Figure 16: Front façade of the NVI**